AIWA®

S/M Code No. 83-028
DATE OF ISSUE 12/1983

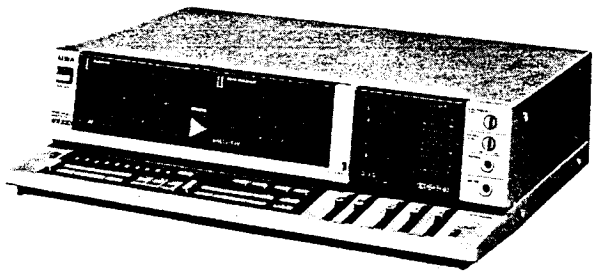
SERVICE MANUAL

MODEL NO.

STEREO CASSETTE DECK

AD-WX220

For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
Tel:- 01844-351694 Fax:- 01844-352554
Email:- enquiries@mauritron.co.uk

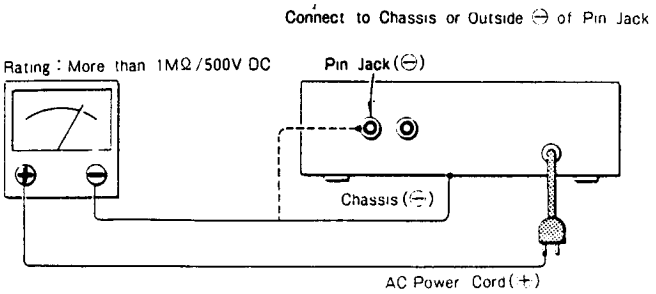


TYPE. H,HB,U,UB,E,EB,K,G,Z,ZB

Follow the instructions carefully, which will allow the user to optimise the products' performance and give many years of serivce.

1. **No scratch and melting shall be made to covered lead-wires of an a.c. primary circuit including mains leads.**
2. **No illegibility shall be given to the specification plate, the caution labels, the fuse labels and others.**
3. **When, on pattern sides of circuit boards, additional repair-parts have been made up, the parts shall be firmly glued to circuit boards or other components, unless the parts can be attached firmly.**
4. **The following matters shall be maintained as they are, when repairing.**
   1) Soldering of lead-wire ends
      * Care should be taken of the space distance in an a.c. primary circuit as well as soldering.
   2) Wiring and holding of lead-wires with wire-clips and binders
   3) Materials of lead-wires
      * e.g.; For UL models, lead-wires to be used shall be approved or accepted by the UL.
   4) Location of all kinds of insulators
   5) Setting of voltage selector switch
      * Set the Voltage Selector Switch to 240V, 220V, or 120V, According to your Local Voltage.
5. **After repaired, the insulation resistance or leakage current shall be measured with 500 ± 5V D.C and shall be not less than 1MΩ.**

Measuring Point



6. **General instructions for mechanism repair**
   1) Lubricants been stained the surfaces of transmitting portion of the belts, idlers, capstan and pinch roller shall be removed, because slippery and faulty tape travel shall be caused.
   2) When oiling, only one or two drops shall be applied so as not to run over and be dispersed. Note should be taken of the metal fitting for the capstan and rotating portions of the
   3) idlers and pinch roller, especially.
      E-rings and poly slider washers shall be replaced with new ones, if once those have been removed. — No re-utilization due to unreliability.
   4) Regular spare-parts shall always be used for repair, because using irregular parts and tampering with the products shall cause deterioration, mulfunction and damage.

SPECIFICATIONS

GENERAL

Power source: H, HB models
AC 120V/220V/240V
Switchable 50/60 Hz
U,UB models
AC 120V , 60 Hz
E, EB, Z, ZB models
AC 220V, 50/60 Hz
K, G models
AC 240V, 50/60 Hz

Power consumption: 45W

Dimensions: 420(W) x 110(H) x 317(D) mm
(16–1/2" x 4–3/8" x 12–1/2")

Weight: 5.6 kg (12.33 lbs.)

Track type: 4 track 4 channels

Tape speed: 4.8 cm/s. (1–7/8 ips)
9.5 cm/s. (at dubbing)

Wow and flutter: Less than 0.038% (WRMS)

Automatic stop system: Full auto stop

Automatic shut-off action time:
Less than 3s.

Pinch roller pressure: 240 ± 30 g (2.35 ± 0.29 N)

Take-up torque: $32\ ^{+8}_{-7}$ g-cm ($0.31\ ^{+0.078}_{-0.069}$ mN · m)

FF & rewind torque: 150 ± 30 g-cm (1.47 ± 0.29 mN · m)

FF & rewind time: 75 ± 10s. (C-60)

Back tension: 1.5 ~ 4 g-cm
(0.015 ~ 0.039 mN · m) (I DECK)
2.5 ~ 4.5 g-cm
(0.025 ~ 0.044 mN · m) (II DECK)

Counter indication error: 0 ± 2.5

Playback output: 510 ± 50 mV (LINE)
(TTA-161)

Playback noise: Less than 1.5 mV
(CrO_2, DOLBY C NR ON)
Less than 3.5 mV
(NORMAL, DOLBY C NR OFF)

REC/PB output: $0VU\ ^{+1.5}_{-0.5}$ dB (II DECK)

REC/PB distortion: Less than 3.0%
(400 Hz, 0VU) (LINE IN, REC/PB, METAL, CrO_2, NORMAL)
Less than 4.0%
(Back side dubbing, METAL, CrO_2, NORMAL)

REC/PB SN ratio: More than 43/49 dB
(400 Hz, 0VU) (METAL, CrO_2, DOLBY C NR OFF/ON)
(Un weighted) More than 42/49 dB
(NORMAL, DOLBY NR C OFF/ON)
(WTD-A) More than 42/49 dB
(METAL, CrO_2, DOLBY C NR OFF/ON)
More than 45/60 dB
(NORMAL, DOLBY C NR OFF/ON)

Channel separation: More than 30 dB
(1 kHz, 0VU)

Erasing ratio: More than 60 dB (Front side)
(METAL, 125 Hz) More than 55 dB (Rear side)

Level drift: Less than ± 1 dB
(10 kHz, 0VU)

Bias frequency: 100 kHz

Dubbing frequency/Sensitivity:
REC/PB input (LINE),
Normal-speed dubbing (Front side)
2 ± 1.5 dB (10 kHz/1 kHz,
DOLBY NR OFF)
0.5 ± 2.0 dB (at 1 kHz)
Double-speed dubbing (Front side)
2.5 ± 3.0 dB
(10 kHz/1 kHz, DOLBY NR OFF)
0 ± 2.0 dB (at 1 kHz)
Double-speed dubbing (Rear side)
0.5 ± 3.0 dB
(10 kHz/1 kHz, DOLBY NR OFF)
0 ± 2.0 dB (at 1 kHz)

Frequency response: METAL : 20 ~ 18,000 Hz
CrO_2 : 20 ~ 17,000 Hz
NORMAL : 20 ~ 16,000 Hz

Motor: DC servomotor x 2
DC motor x 2

Heads: Playback head: SH head (I DECK)
Record/playback head: SH head (II DECK)
Erase head: Double-gap ferrite head

Input/impedance: MIC maximum input sensitivity:
–70 dB/5.6 kΩ
LINE IN maximum input sensitivity:
–26 dB/50 kΩ

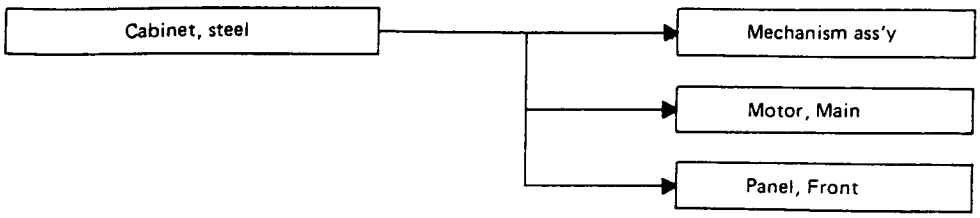
Output/impedance/load impedance:
LINE OUT standard output level:
380 mV (0VU/3.2 kΩ/47 kΩ)
Suitable load impedance:
PHONE 0.8 mV/8 Ω

TEST TAPE: TTA-119MX (METAL)
TTA-119G (CrO_2)
TTA-119J (NORMAL)

- Specifications and external appearance are subject to change without due to product improvement.
- Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.
- Dolby and the DD symbol are trademarks of Dolby Laboratories Licensing Corporation.

DISASSEMBLY INSTRUCTIONS

Exploded process



1. Removing Steel Cabinet

1) Remove the 8 screws. (See Figure-1)

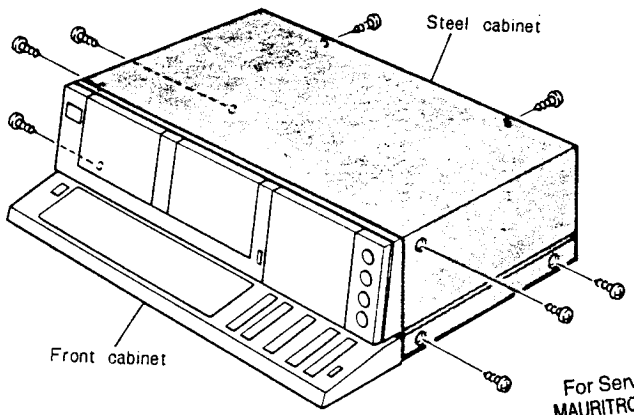


Fig. 1

2. Removing Front Panel

1) Remove the 9 screws.(See Figure-2)

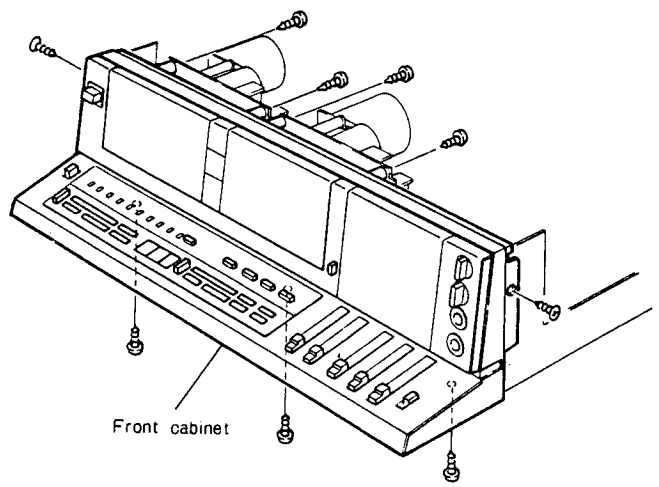


Fig. 2

3. Removing I and II Mechanism ass'y

1) Remove the 4 screws. (See Figure-3)

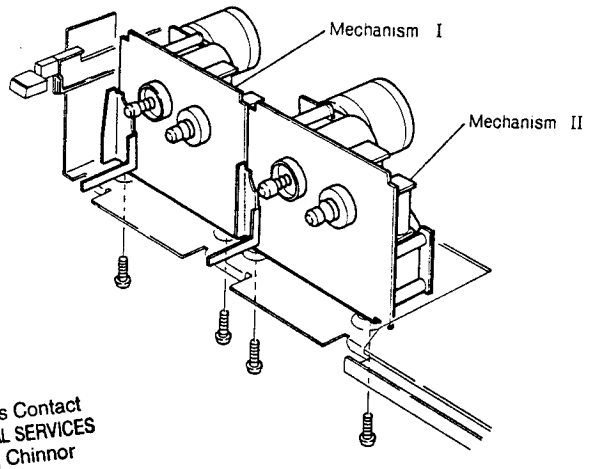


Fig. 3

For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
Tel:- 01844-351694 Fax:- 01844-352554
Email:- enquiries@mauritron.co.uk

4. Removing Main Motor

1) Remove the single screw in the direction of the arrow. (See Figure-4)

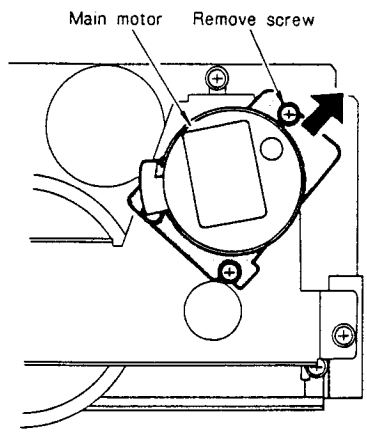
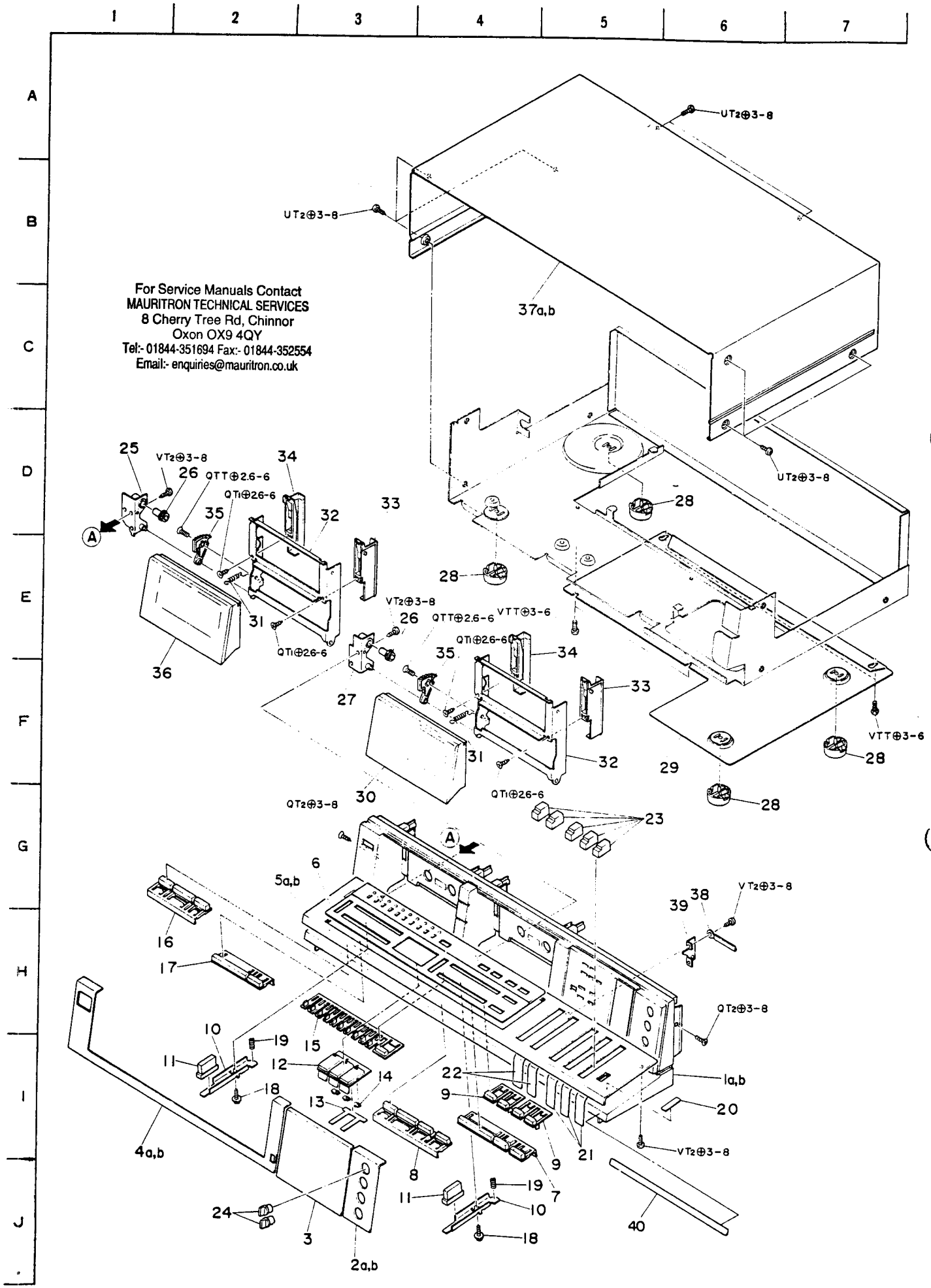


Fig. 4

EXPLODED VIEW-1



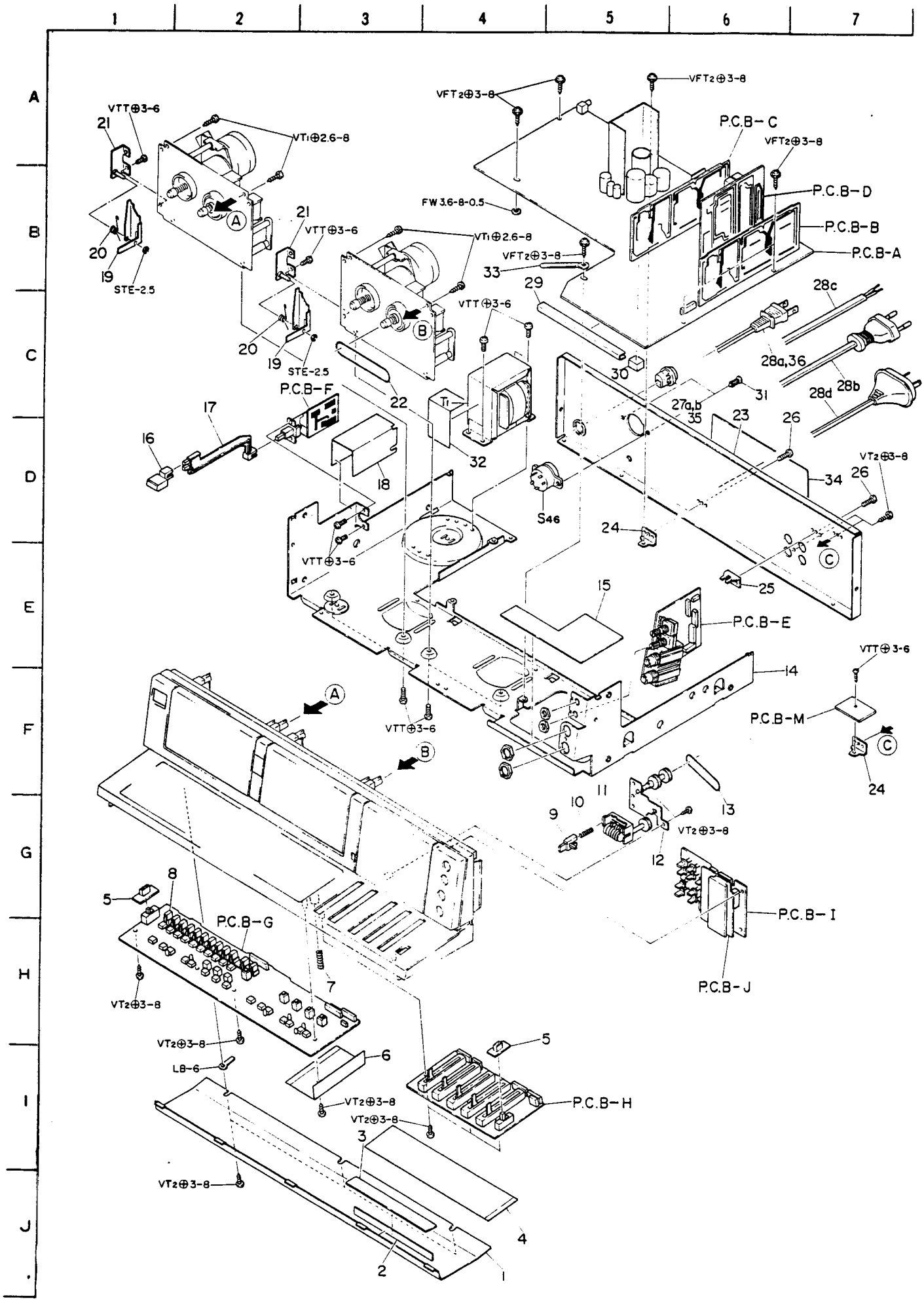
For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
Tel:- 01844-351694 Fax:- 01844-352554
Email:- enquiries@mauritron.co.uk

MECHANICAL PARTS LIST

■* mark in this part list shows exclusive part

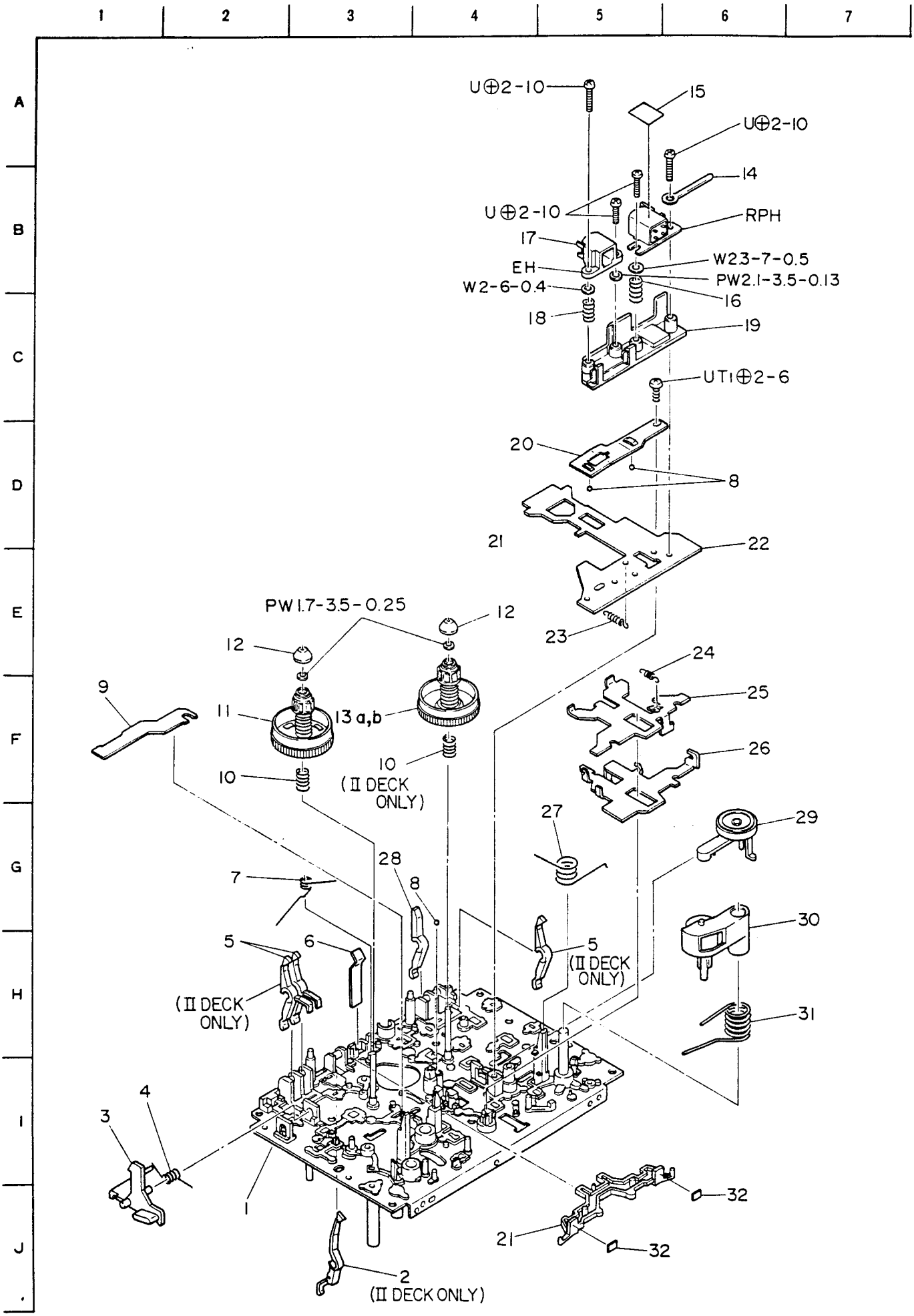
Ref. No.	Part No.	Part No. changed to	Description	Common Model	Q'ty
1-1a~19	82-196-002-11		**Front cabinet ass'y (H, U, E, K, G, Z models only)**	*	1
1-1b~19	82-196-068-01		**Front cabinet ass'y (HB, UB, EB, ZB models only)**	*	1
1-1a	82-196-003-11		Cabinet, Front (H, U, E, K, G, Z models only)	*	1
b	82-196-069-01		Cabinet B, Front (HB, UB, EB, ZB models only)	*	1
1-2a	82-196-025-01		Panel R, Front (H, U, E, K, G, Z models only)	*	1
b	82-196-071-01		Panel R, Front (HB, UB, EB, ZB models only)	*	1
1-3	82-196-004-01		Window, Meter	*	1
1-4a	82-196-055-01		Panel L, Front (H, U, E, K, G, Z models only)	*	1
b	82-196-070-01		Panel L, Front (HB, UB, EB, ZB models only)	*	1
1-5a	82-196-058-01		Control panel sub ass'y (H, U, E, K, G, Z models only)	*	1
b	82-196-074-01		Control panel sub ass'y (HB, UB, EB, ZB models only)	*	1
1-6	82-196-005-21		Panel, Control	*	1
1-7	82-196-010-01		Touch-key stop sub ass'y	*	1
1-8	82-196-008-01		Touch-key play sub ass'y	*	1
1-9	82-196-013-01		Touch-key, Dolby A	*	2
1-10	82-196-214-01		Eject lever A	*	2
1-11	82-196-016-01		Eject knob	*	2
1-12	82-196-014-01		Touch-key, Dubbing	*	1
1-13	82-196-229-01		Blind sheet	*	1
1-14	82-123-016-01		Guide, Light	LX-100	1
1-15	82-196-012-01		Touch-key, Memory	*	1
1-16	82-196-009-01		Touch-key play sub ass'y 2	*	1
1-17	82-196-011-01		Touch-key stop sub ass'y 2	*	1
1-18	87-511-094-21		VFT $\frac{1}{4}$ + 3 – 6		2
1-19	82-196-227-01		C-spring, Eject	*	2
1-20	82-196-339-01		Fiver 6-25	*	3
1-21	82-196-054-01		Sheet, Slide volume 2	*	3
1-22	82-196-052-01		Sheet, Slide volume	*	2
1-23	82-196-026-11		Knob, Slide volume	*	5
1-24	82-155-008-01		Knob, PB	AD-M800	2
1-25	82-196-210-01		Cassette box B holder ass'y	*	1
1-26	82-534-264-01		Gear, Oil dump		2
1-27	82-196-205-01		Cassette box A holder ass'y	*	1
1-28	87-055-055-01		Rubber foot		4
1-29	82-196-023-01		Cabinet, Bottom	*	1
1-30	82-196-020-01		Cassette window B ass'y	*	1
1-31	82-196-225-01		E-spring, Cassette box	*	2
1-32	82-196-202-01		Cassette box ass'y	*	2
1-33	82-196-029-01		Holder R, Cassette	*	2
1-34	82-196-028-01		Holder L, Cassette	*	2
1-35	82-161-325-11		Gear, Oil dump		2
1-36	82-196-017-01		Cassette window A ass'y	*	1
1-37a	82-188-035-11		Cabinet, steel (H, U, E, K, G, Z models only)	AD-F990	1
b	82-196-073-01		Cabinet B, Steel (HB, UB, EB, ZB models only)	*	1
1-38	87-038-039-01		Wire binder		1
1-39	82-196-212-01		Cassette box holder C ass'y	*	1
1-40	82-196-061-11		Sheet, BIAS instruction	*	1

EXPLODED VIEW-2



Ref. No.	Part No.	Part No. changed to	Description	Common Model	Q'ty
2-1	82-196-015-11		Cabinet A, Bottom	*	1
2-2	82-196-236-11		Film sheet A	*	1
2-3	82-196-238-06		Sheet 30-110, Bottom cabinet	*	2
2-4	82-196-231-01		Cover A	*	1
2-5	82-196-045-01		Knob, Slide switch	*	2
2-6	82-196-242-01		Shield plate, Circuit board	*	1
2-7	82-196-235-11		C-spring, Earth	*	1
2-8	82-196-223-01		Guide, LED	*	1
2-9	82-196-032-01		Knob, Counter reset	*	1
2-10	82-196-224-01		C-spring, Counter reset	*	1
2-11	87-040-167-01		Counter		1
2-12	82-196-220-11		Counter holder ass'y	*	1
2-13	82-422-279-01		Belt, Counter		1
2-14	82-196-201-11		Chassis, Amp.	*	1
2-15	82-196-232-01		Cover B	*	1
2-16	84-700-003-01		Push-button, POWER		1
2-17	82-587-206-01		Rod 87.8	CS-880	1
2-18a	82-196-234-01		Cover, POWER (H, HB models only)	*	1
b	82-196-244-01		Cover, POWER (U, UB, E, EB, K, G, Z, ZB models only)	*	1
2-19	82-196-215-01		Eject lover B	*	2
2-20	82-196-228-01		T-spring, Eject	*	2
2-21	82-196-217-01		Eject lever holder ass'y	*	2
2-22	82-196-240-01		Belt ϕ45.2	*	1
2-23a~28a	**82-196-059-11**		**Rear panel ass'y (H, HB models only)**	*	1
2-23b~26	**82-196-062-01**		**Rear panel ass'y (U, UB models only)**	*	1
2-23c~28b	**82-196-063-11**		**Rear panel ass'y (E, EB models only)**	*	1
2-23d~28c	**82-196-064-11**		**Rear panel ass'y (K model only)**	*	1
2-23e~28d	**82-196-066-01**		**Rear panel ass'y (G model only)**	*	1
2-23f~28b	**82-196-067-01**		**Rear panel ass'y (Z, ZB models only)**	*	1
2-23a	82-196-046-11		Panel, Rear (H, HB models only)	*	1
b	82-196-050-01		Panel, Rear (U, UB models only)	*	1
c	82-196-048-01		Panel, Rear (E, EB models only)	*	1
d	82-196-049-01		Panel, Rear (K model only)	*	1
e	82-196-051-01		Panel, Rear (G model only)	*	1
f	82-196-065-01		Panel, Rear (Z, ZB models only)	*	1
2-24	82-184-223-01		Holder 2, Circuit board	FX-100	2
2-25	82-196-233-01		Holder H, Circuit board	*	1
2-26	87-081-502-01		VTT + 2.6-6		3
2-27a	87-085-184-01		Cord bushing (H, HB models only)		1
b	87-085-185-01		Cord bushing (E, EB, K, G, Z, ZB models only)		1
2-28a	87-034-958-01		AC power cord (H, HB models only)		1
b	87-034-877-01		AC power cord (E, EB, Z, ZB models only)		1
c	87-034-975-01		AC power cord (K model only)		1
d	87-034-892-01		AC power cord (G model only)		1
2-29	82-196-237-01		Felt 15-110	*	1
2-30	82-190-213-01		G cushion 18-8	AD-F660	1
2-31	87-085-090-01		Nylon rivet 3-6.5 (H, HB model only)		2
2-32	82-790-650-01		Insulation sheet (K, Z, ZB models only)	MX-70	1
2-33	87-038-039-01		Wire binder		1
2-34	82-196-056-01		Name plate, Spec. (U, UB model only)	*	1
2-35	87-085-184-01		Cord bushing (U, UB models only)		1
2-36	87-034-951-01		AC power cord (U, UB models only)		1

EXPLODED VIEW-3



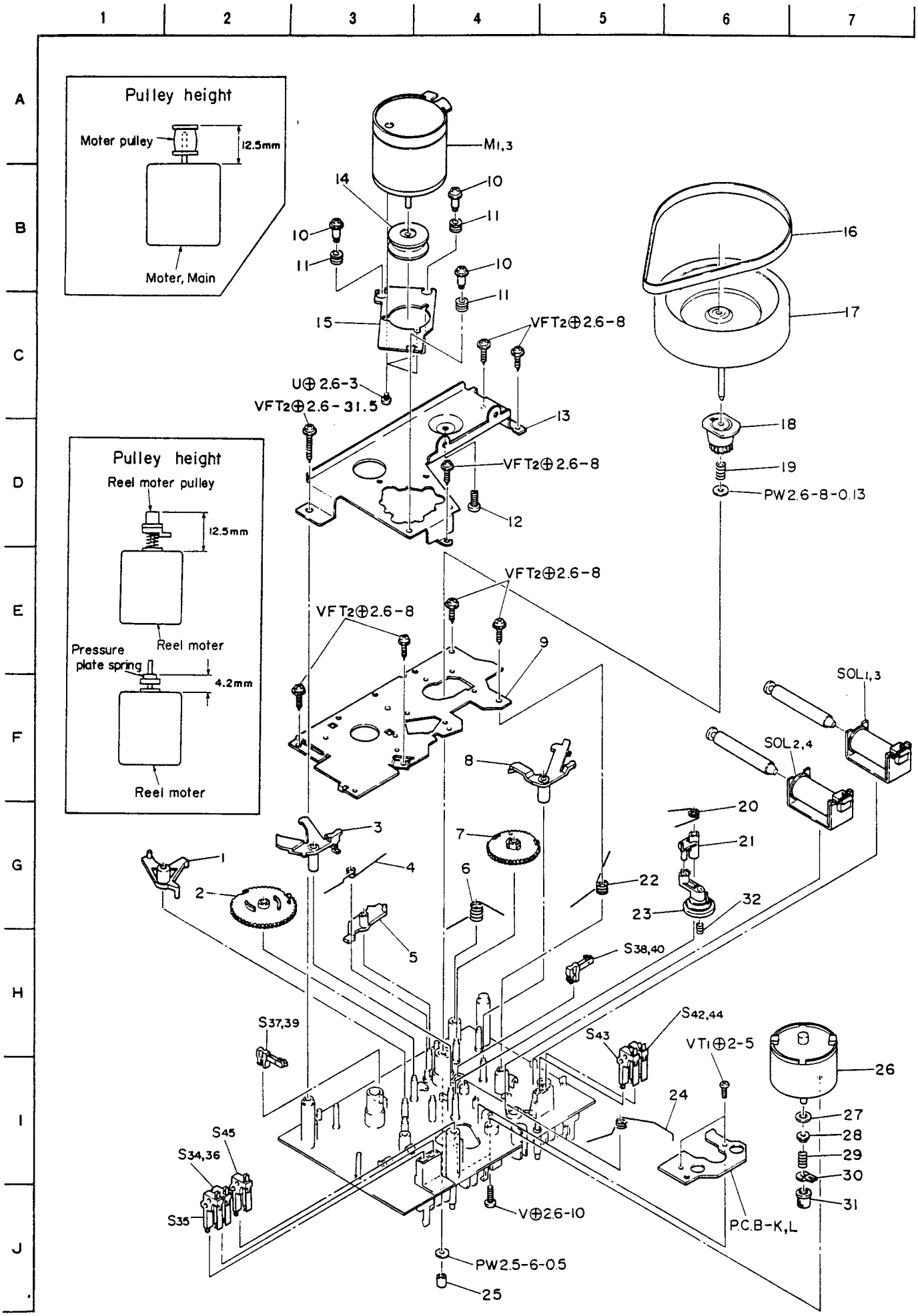
The following parts list shows the common parts of I and II Decks, and also the exclusive parts of B Deck.

Ref. No.	Part No.	Part No. changed to	Description	Common Model	Q'ty
3-1	81-505-297-31		Outsert chassis ass'y		2
3-2	81-505-242-11		Lever, Metal (II DECK model only)		1
3-3	81-505-239-01		Eject lever		2
3-4	81-505-273-01		T-spring, Lid lock		2
3-5	81-505-241-21		Lever, REC blocking		I:1/II:3
3-6	81-505-260-01		P-spring, Pressure cassette		2
3-7	81-505-268-01		T-spring, Slide brake		2
3-8	87-073-005-01		Steel ball $\phi 2$		6
3-9	81-505-238-01		Blocking lever, Eject		2
3-10	81-505-274-01		C-spring, Supply reel platform		I:1/II:2
3-11	81-505-275-01		Supply reel platform ass'y		2
3-12	82-303-398-01		Cap, Take-up reel platform		4
3-13a	81-505-276-21		Take-up reel platform ass'y (I DECK model only)		1
b	81-505-338-01		Take-up reel platform ass'y (II DECK model only)		1
3-14	87-038-056-01		Wire binder		2
3-15	87-057-645-01		Lable SH, Head		2
3-16	81-505-262-01		C-spring, RPH		2
3-17	82-598-622-01		EH dummy (I DECK model only)		1
3-18	81-505-285-01		C-spring, EH		2
3-19	81-505-279-11		Head base 3H		2
3-20	81-505-259-01		P-spring, Actuating chassis		2
3-21	81-505-236-01		Lever, Slide brake		2
3-22	81-505-266-11		Actuating chassis		2
3-23	81-505-333-01		E-spring, Actuating chassis		2
3-24	81-505-266-01		E-spring, PAUSE plate		2
3-25	81-505-207-01		PAUSE plate		2
3-26	81-505-208-01		Plate, Pinch lever		2
3-27	81-505-270-01		T-spring, Idler lever		2
3-28	81-505-240-01		Lever, Cassette sensor		2
3-29	81-505-216-31		Idler lever ass'y		2
3-30	81-505-210-21		Pinch lever ass'y		2
3-31	81-505-302-01		T-spring, Pinch FP		2
3-32	81-505-237-01		Felt, Slide brake		4

Part No.	Description
87-251-037-21	U+2-10
87-251-070-21	U+2.6-3
87-261-075-21	V+2.6-10
87-351-034-11	VT_1 +2-5
87-351-074-21	VT_1 +2.6-8
87-321-073-21	QT_1 +2.6-6
87-341-035-21	UT_1 +2-6
87-340-095-01	UT_2 +3-8
87-353-095-21	VT_2 +3-8
87-081-511-01	VTT+3-6
87-081-525-01	QTT+2.6-6
87-323-095-21	QT_2 +3-8

Part No.	Description
87-512-074-01	VFT_2 +2.6-8
81-505-229-01	VFT_2 +2.6-30
87-513-095-01	VFT_2 +3-8
87-081-808-01	PW1.7-3.5-0.25
87-067-015-01	PW2.1-3.5-0.13
82-416-358-01	PW2.5-6-0.5
87-067-052-01	PW2.6-8-0.13
87-081-998-01	FW3.1-6-1.0
87-081-911-01	FW3.6-8-0.5
87-410-305-01	W2-6-0.4
87-410-308-01	W2.3-7-0.5
87-441-008-01	STE-2.5

EXPLODED VIEW-4



Ref. No.	Part No.	Part No. changed to	Description	Common Model	Q'ty
4-1	81-505-230-01		Lever, PLAY		2
4-2	81-505-234-11		Gear, PLAY cam		2
4-3	81-505-231-01		Trigger lever, PLAY		2
4-4	81-505-332-01		T-spring, Cam		2
4-5	81-505-232-01		Lever, PAUSE		2
4-6	81-505-283-01		T-spring, PAUSE lever		2
4-7	81-505-235-01		Gear, PAUSE cam		2
4-8	81-505-233-01		Trigger lever, PAUSE		2
4-9	81-505-204-11		Chassis B, Mechanism		2
4-10	87-081-483-01		Motor screw, M2.6		6
4-11	87-087-029-01		Rubber cushion		6
4-12	82-794-219-01		Screw, Thrust		2
4-13	82-196-230-11		Holder W, Motor	*	2
4-14	81-505-300-01		Pulley 2-16.8, Motor		2
4-15	82-598-228-01		Plate, Motor	CA-W10	2
4-16	82-180-223-01		Rubber belt, Main	SD-L80	2
4-17	81-505-316-11		Flywheel C ass'y		2
4-18	81-505-225-01		Gear, Flywheel		2
4-19	81-505-261-01		C-spring, Flywheel F		2
4-20	81-505-282-01		T-spring, FR idler		2
4-21	81-505-254-11		Lever A, FR idler		2
4-22	81-505-271-01		T-spring, Trigger lever		2
4-23	81-505-301-11		FR idler P ass'y		2
4-24	81-505-269-01		T-spring, Pinch plate		2
4-25	81-505-246-11		Rubber, Drive		2
4-26~31	**09-047-198-01**		**Reel motor ass'y**		**2**
4-26	81-505-604-11		Reel motor		2
4-27	81-505-328-01		Felt 4.5-7.2-1		2
4-28	82-505-289-01		Pressure plate spring		2
4-29	81-505-290-01		C-spring, FR idler C		2
4-30	81-505-257-01		Pulley, Reel motor		2
4-31	81-505-335-01		Spacer C		2

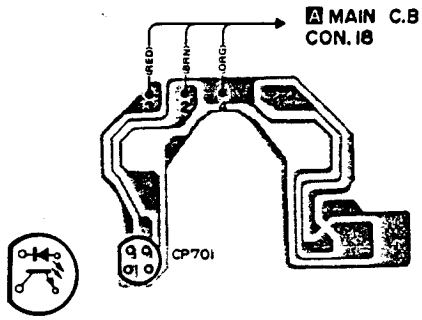
■ACCESSORIES/PACKAGE LIST

Ref. No.	Part No.	Part No. changed to	Description	Common Model	Q'ty
1	82-196-854-01		Printed indiv., Packing	*	1
2	82-196-852-01		Front cushion, Printed indiv.	*	1
3	82-196-853-01		Rear cushion, Printed indiv.	*	1
4	82-190-855-01		Pad, Auxiliary	AD-FF60	1
5 a	82-196-855-01		Outer carton (H, HB,E, EB, K, G, Z, ZB models only)	*	1
b	82-196-856-01		Outer carton (U, UB, models only)	*	1
6	87-051-131-11		Poly-Dinyl sack (H, HB, U, UB models only)		1
7	87-051-135-11		Poly-vinyl sack (E, EB, K, G, Z, ZB models only)		1
8	87-056-627-01		Poly-Vinyl sack		1
9	87-056-651-01		Color label, Black (HB, UB, EB, ZB models only)		1
10	82-196-904-01		Instructions booklet	*	1
11	82-598-916-01		Caution label Dubbing (K model only)		1
12	87-051-171-11		Poly-Vinyl sack		1
13	87-056-008-11		Label, AC power cord (K model only)		1
14	87-056-009-51		Distributors list (H, HB, E, EB, K, G, Z, ZB models only)		1
15 a	87-056-045-01		Guarantee card (U, UB models only)		1
b	87-056-059-01		Guarantee card (G model only)		1
16	87-056-050-11		Safety instruction (U, UB models only)		1
17	87-056-084-01		Waranty card (U, UB models only)		1
18	87-032-845-01		Siempns plug (H, HB models only)		1
19	87-034-978-01		Connection cord, CW-254BSK		1

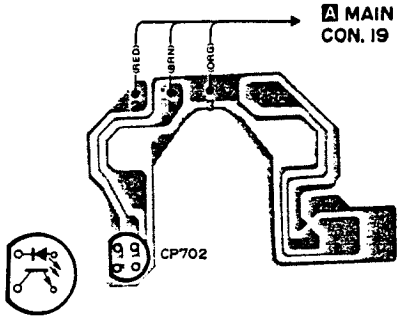
AIWA Co., Ltd. Tokyo Japan

Printed in japan

K LED-2 C.B (DECK I)

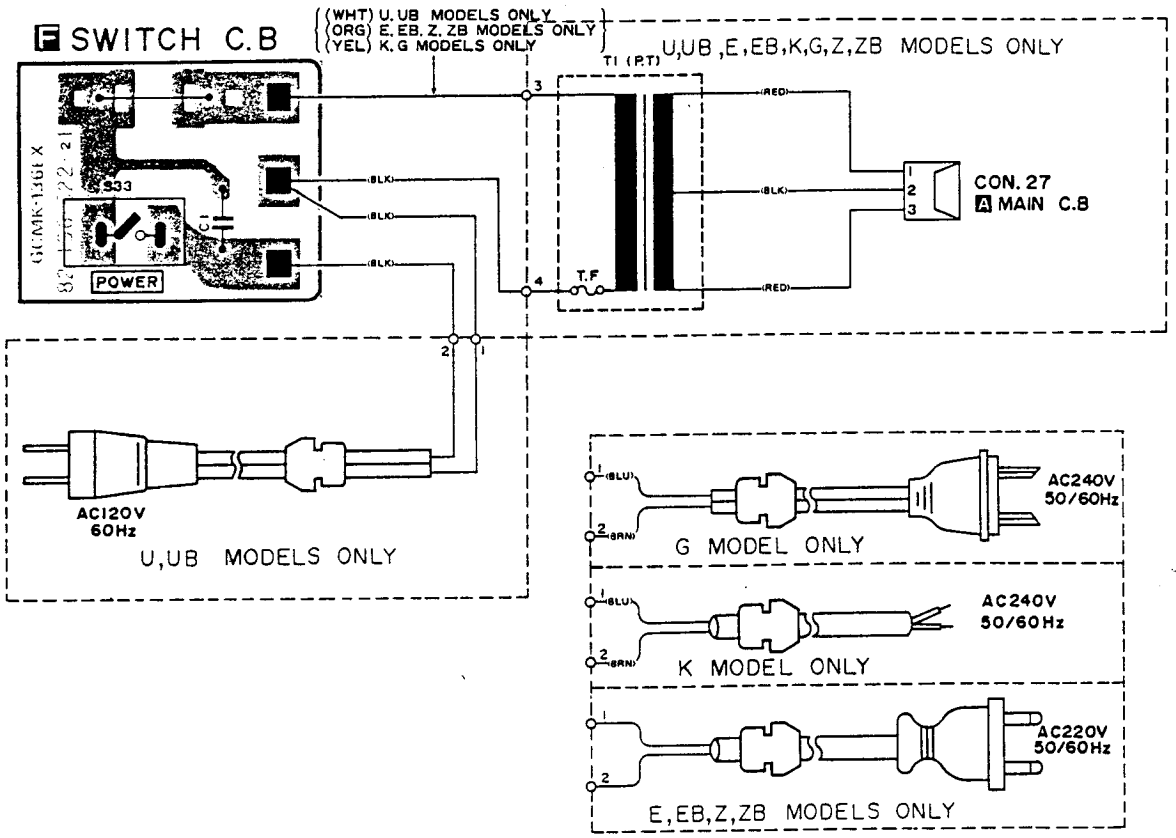


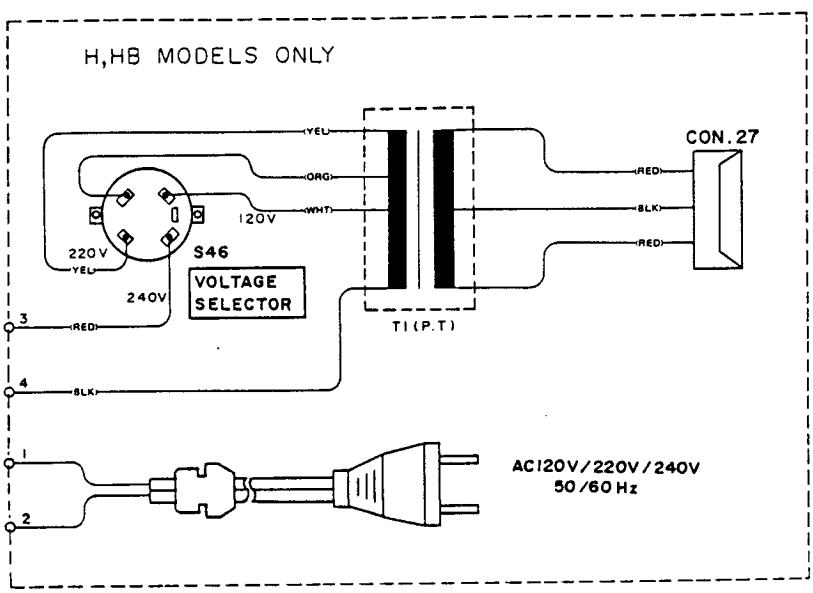
L LED-3 C.B (DECK II)



For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
Tel:- 01844-351694 Fax:- 01844-352554
Email:- enquiries@mauritron.co.uk

F SWITCH C.B





11. Dubbing sensiti
Settings: Test
Reco
Dubb
Adju
loc
Method: Load
LINE
mode

14. Dolby trap cor
Settings: Test
Dolb
se
Adju
lo
Method: Loac
and
OUT
set t

10. NORMAL tap
Settings: Test
Inpu
Adju
lo
Method: Set
reco
just
Ratings: CrO_2
MET

9. NORMAL tap
ment (normal
Settings: Test
Inpu
Adju
lo
Method: Set
VR
Reco
diffe
they
Ratings: CrO_2
MET

8. Erase current a
Settings: Dubl
Test
Adju
lo
Method: Adju
mum

7. Bias oscillation
Settings: Test
Test
Adju
lo
Method: Loac
bias
just
100

12. Track B (B
characteristics
Settings: Test
Dub
Adju
lo
Method: Loa
so
TTA
sign
TTA
fere
Ratings: CrO
ME

hers pattern

6 | 7

DECK II)

A MAIN C.B
CON. 19

EB,K,G,Z,ZB MODELS ONLY

(RED)
(BLK)
(RED)
1
2
3
CON. 27
A MAIN C.B

AC240V
50/60Hz
DEL ONLY

AC240V
50/60Hz
DEL ONLY

AC220V
50/60Hz
ZB MODELS ONLY

ADJUSTMENT

11. Dubbing sensitivity adjustment

Settings: Test tape: TTA-161
Record volume: Dubbing level
Dubbing switch: A
Adjustment location: SFR107 (L-ch), SFR108 (R-ch)
Method: Load a test tape in Deck II and adjust so that the LINE OUT output 510mV in the normal speed mode.

4. PB sensitivity adjustment

Settings: Test tape: TTA-161
Adjustment location: (Deck I) SFR105 (L-ch), SFR106 (R-ch) (Deck II) SFR111 (L-ch), SFR112 (R-ch)
Method: Adjust so that the LINE OUT output is set to 510mV ±0.5dB in Deck I and Deck II. When Deck II is adjustad, Deck I also changes, so repeat adjustment.

14. Dolby trap coil adjustment

Settings: Test tape: TTA-119MX
Dolby-NR switch: ON, C
Adjustment location: L101 (L-ch), L102 (R-ch)
Method: Load a test tape in Deck II, set to the record mode and adjust so that the bias leakage from the LINE OUT output is minimum with the Dolby-NR switch set to ON, C.

10. NORMAL tape record sensitivity adjustment (normal speed)

Settings: Test tape: TTA-119J
Input signal: 1kHz, 0VU
Adjustment location: SFR125 (L-ch), SFR126 (R-ch)
Method: Set Deck II to the record mode, load a test tape and record at 1kHz, 0VU. Play back on Deck I and adjust so that the LINE OUT output is 380mV±0.5dB.
Ratings: CrO_2 tape (TTA-119G): 380mV±1.5dB
METAL tape (TTA-119MX): 380mV±1.5dB

9. NORMAL tape record/play frequency characteristics adjustment (normal speed)

Settings: Test tape: TTA-119J
Input signal: LINE IN 0VU 1kHz/10kHz
Adjustment location: SFR121 (L-ch), SFR122 (R-ch)
Method: Set Deck II to the record mode and adjust the REC VR so that the LINE OUT output is 380mV. Record the 1kHz/10kHz signals and adjust so that difference between two outputs is 0±0.5dB when they are played back on Deck I.
Ratings: CrO_2 tape (TTA-119G): 0±1dB
METAL tape (TTA-119MX): 0±1dB

8. Erase current adjustment

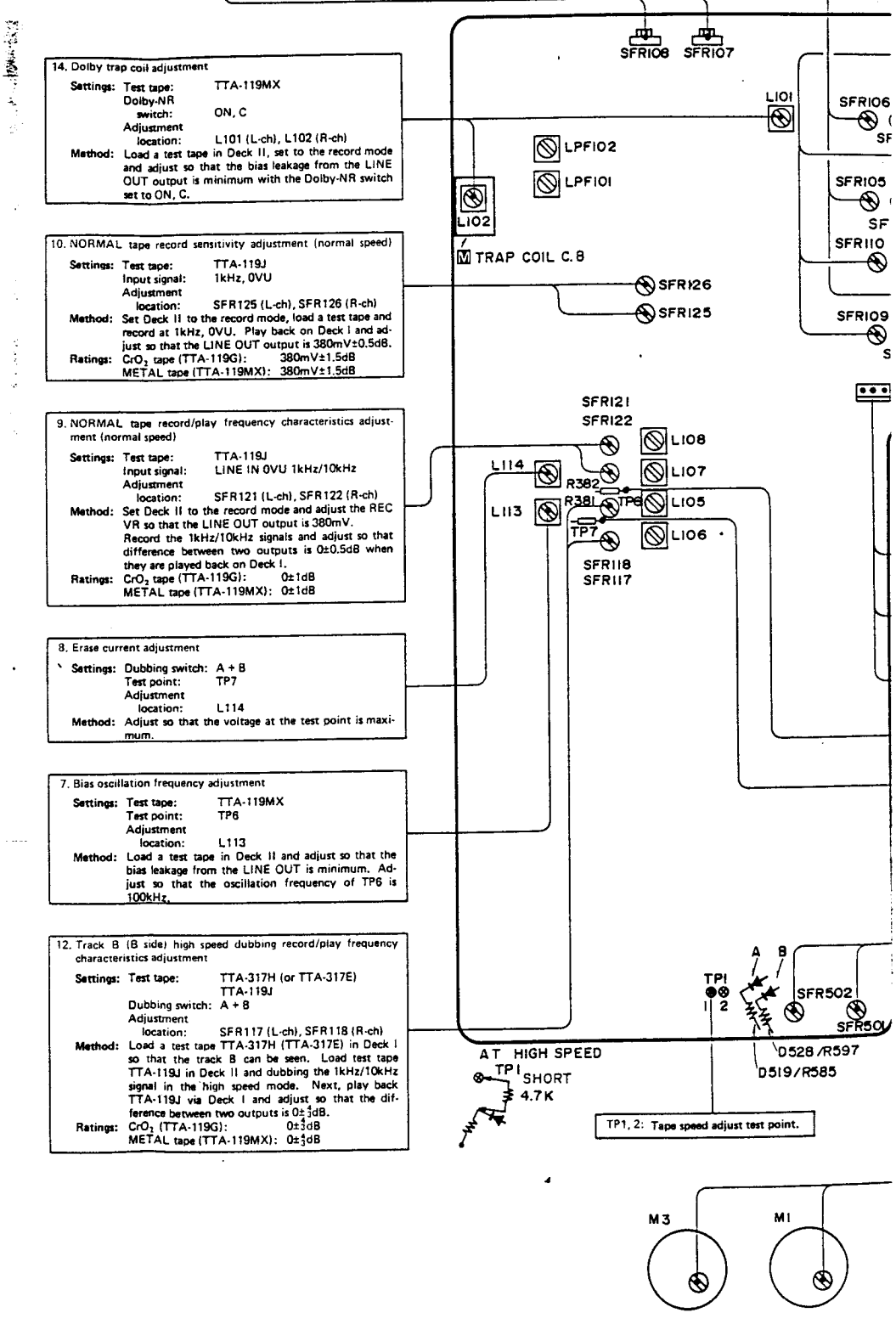
Settings: Dubbing switch: A + B
Test point: TP7
Adjustment location: L114
Method: Adjust so that the voltage at the test point is maximum.

7. Bias oscillation frequency adjustment

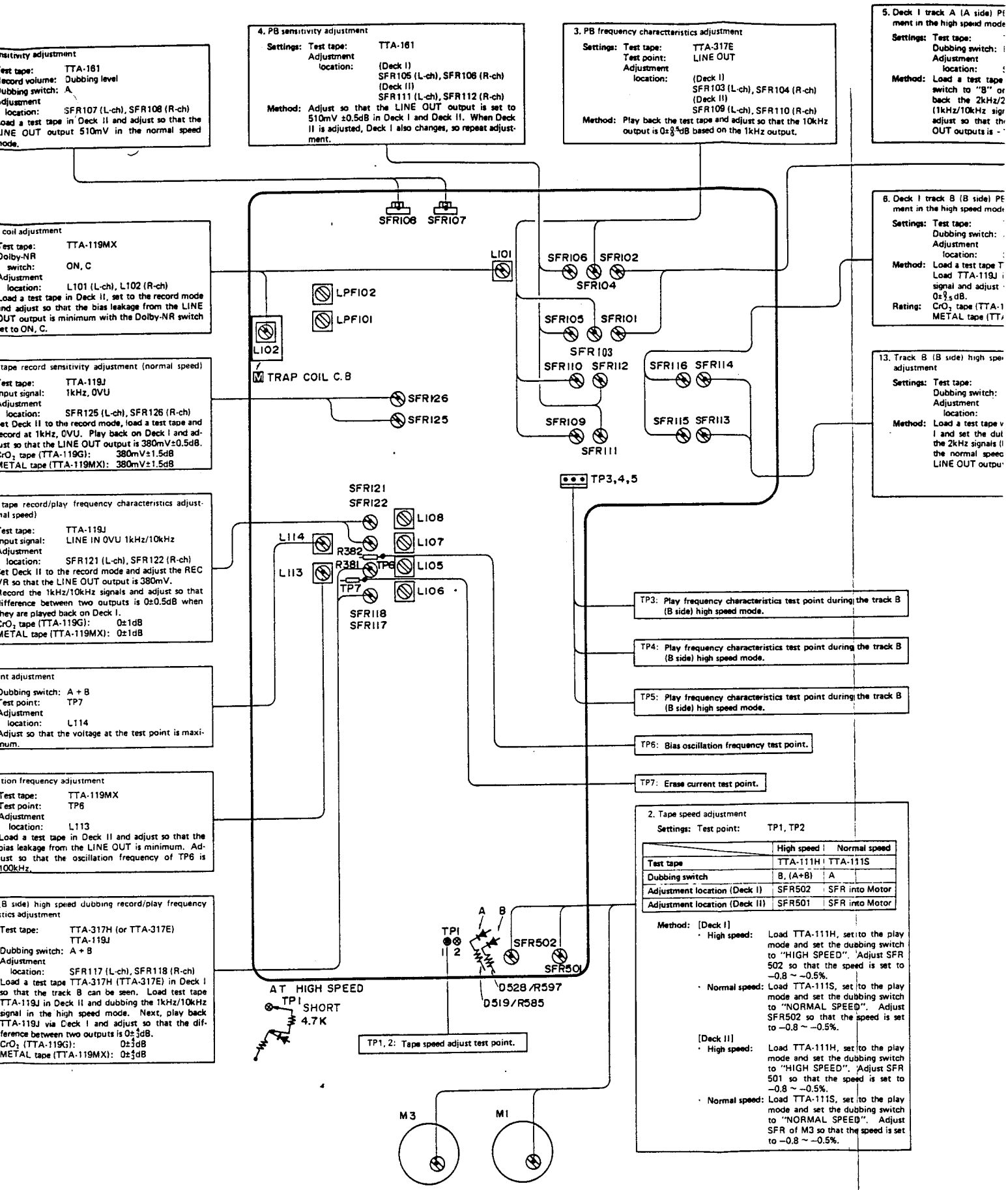
Settings: Test tape: TTA-119MX
Test point: TP6
Adjustment location: L113
Method: Load a test tape in Deck II and adjust so that the bias leakage from the LINE OUT is minimum. Adjust so that the oscillation frequency of TP6 is 100kHz.

12. Track B (B side) high speed dubbing record/play frequency characteristics adjustment

Settings: Test tape: TTA-317H (or TTA-317E)
TTA-119J
Dubbing switch: A + B
Adjustment location: SFR117 (L-ch), SFR118 (R-ch)
Method: Load a test tape TTA-317H (TTA-317E) in Deck I so that the track B can be seen. Load test tape TTA-119J in Deck II and dubbing the 1kHz/10kHz signal in the high speed mode. Next, play back TTA-119J via Deck I and adjust so that the difference between two outputs is 0±$\frac{1}{3}$dB.
Ratings: CrO_2 (TTA-119G): 0±$\frac{1}{3}$dB
METAL tape (TTA-119MX): 0±$\frac{1}{3}$dB



MENT


sitivity adjustment
est tape: TTA-161
ecord volume: Dubbing level
ubbing switch: A
djustment location: SFR107 (L-ch), SFR108 (R-ch)
oad a test tape in Deck II and adjust so that the INE OUT output 510mV in the normal speed ode.
4. PB sensitivity adjustment
Settings: Test tape: TTA-161
Adjustment location: (Deck I) SFR105 (L-ch), SFR106 (R-ch) (Deck II) SFR111 (L-ch), SFR112 (R-ch)
Method: Adjust so that the LINE OUT output is set to 510mV ±0.5dB in Deck I and Deck II. When Deck II is adjusted, Deck I also changes, so repeat adjustment.
3. PB frequency charactteristics adjustment
Settings: Test tape: TTA-317E
Test point: LINE OUT
Adjustment location: (Deck I) SFR103 (L-ch), SFR104 (R-ch) (Deck II) SFR109 (L-ch), SFR110 (R-ch)
Method: Play back the test tape and adjust so that the 10kHz output is 0±0.5dB based on the 1kHz output.
5. Deck I track A (A side) PE ment in the high speed mode
Settings: Test tape:
Dubbing switch:
Adjustment location:
Method: Load a test tape switch to "B" or back the 2kHz/2 (1kHz/10kHz sign adjust so that th OUT outputs is -
6. Deck I track B (B side) PE ment in the high speed mode
Settings: Test tape:
Dubbing switch:
Adjustment location:
Method: Load a test tape T Load TTA-119J signal and adjust 0±0.5dB.
Rating: CrO2 tape (TTA-1 METAL tape (TT
coil adjustment
Test tape: TTA-119MX
Dolby-NR switch: ON, C
Adjustment location: L101 (L-ch), L102 (R-ch)
Load a test tape in Deck II, set to the record mode and adjust so that the bias leakage from the LINE OUT output is minimum with the Dolby-NR switch set to ON, C.
tape record sensitivity adjustment (normal speed)
Test tape: TTA-119J
Input signal: 1kHz, 0VU
Adjustment location: SFR125 (L-ch), SFR126 (R-ch)
Set Deck II to the record mode, load a test tape and record at 1kHz, 0VU. Play back on Deck I and adjust so that the LINE OUT output is 380mV±0.5dB.
CrO2 tape (TTA-119G): 380mV±1.5dB
METAL tape (TTA-119MX): 380mV±1.5dB
tape record/play frequency characteristics adjustnal speed)
Test tape: TTA-119J
Input signal: LINE IN 0VU 1kHz/10kHz
Adjustment location: SFR121 (L-ch), SFR122 (R-ch)
Set Deck II to the record mode and adjust the REC VR so that the LINE OUT output is 380mV.
Record the 1kHz/10kHz signals and adjust so that difference between two outputs is 0±0.5dB when they are played back on Deck I.
CrO2 tape (TTA-119G): 0±1dB
METAL tape (TTA-119MX): 0±1dB
nt adjustment
Dubbing switch: A + B
Test point: TP7
Adjustment location: L114
Adjust so that the voltage at the test point is maximum.
tion frequency adjustment
Test tape: TTA-119MX
Test point: TP6
Adjustment location: L113
Load a test tape in Deck II and adjust so that the bias leakage from the LINE OUT is minimum. Adjust so that the oscillation frequency of TP6 is 100kHz.
B side) high speed dubbing record/play frequency tics adjustment
Test tape: TTA-317H (or TTA-317E) TTA-119J
Dubbing switch: A + B
Adjustment location: SFR117 (L-ch), SFR118 (R-ch)
Load a test tape TTA-317H (TTA-317E) in Deck I so that the track B can be seen. Load test tape TTA-119J in Deck II and dubbing the 1kHz/10kHz signal in the high speed mode. Next, play back TTA-119J via Deck I and adjust so that the difference between two outputs is 0±0.5dB.
CrO2 (TTA-119G): 0±0.5dB
METAL tape (TTA-119MX): 0±0.5dB
SFR108 SFR107
L101
SFR106 SFR102
SFR104
LPF102
LPF101
L102
TRAP COIL C.B
SFR105 SFR101
SFR103
SFR110 SFR112
SFR116 SFR114
SFR126
SFR125
SFR109
SFR115 SFR113
SFR111
TP3,4,5
SFR121
SFR122
L108
L107
L105
L106
L114
L113
R382
R381
TP6
TP7
SFR118
SFR117
TP3: Play frequency characteristics test point during the track B (B side) high speed mode.
TP4: Play frequency characteristics test point during the track B (B side) high speed mode.
TP5: Play frequency characteristics test point during the track B (B side) high speed mode.
TP6: Bias oscillation frequency test point.
TP7: Erase current test point.
2. Tape speed adjustment
Settings: Test point: TP1, TP2
High speed / Normal speed
Test tape: TTA-111H / TTA-111S
Dubbing switch: B, (A+B) / A
Adjustment location (Deck I): SFR502 / SFR into Motor
Adjustment location (Deck II): SFR501 / SFR into Motor
Method: [Deck I]
· High speed: Load TTA-111H, set to the play mode and set the dubbing switch to "HIGH SPEED". Adjust SFR 502 so that the speed is set to −0.8 ~ −0.5%.
· Normal speed: Load TTA-111S, set to the play mode and set the dubbing switch to "NORMAL SPEED". Adjust SFR502 so that the speed is set to −0.8 ~ −0.5%.
[Deck II]
· High speed: Load TTA-111H, set to the play mode and set the dubbing switch to "HIGH SPEED". Adjust SFR 501 so that the speed is set to −0.8 ~ −0.5%.
· Normal speed: Load TTA-111S, set to the play mode and set the dubbing switch to "NORMAL SPEED". Adjust SFR of M3 so that the speed is set to −0.8 ~ −0.5%.
A B
TP1
1 2
SFR502
SFR501
D528/R597
D519/R585
AT HIGH SPEED
TP1
SHORT
4.7K
TP1, 2: Tape speed adjust test point.
M3
M1

3. PB frequency characteristics adjustment

Settings: Test tape: TTA-317E
Test point: LINE OUT
Adjustment location: (Deck I) SFR103 (L-ch), SFR104 (R-ch) (Deck II) SFR109 (L-ch), SFR110 (R-ch)

Method: Play back the test tape and adjust so that the 10kHz output is 0±$^{0.5}_{0}$dB based on the 1kHz output.

5. Deck I track A (A side) PB frequency characteristics adjustment in the high speed mode

Settings: Test tape: TTA-317H (or TTA-317E)
Dubbing switch: B
Adjustment location: SFR101 (L-ch), SFR102 (R-ch)

Method: Load a test tape in Deck I and set the dubbing switch to "B" or short-circuit the test pin. Play back the 2kHz/20kHz signal (high speed mode) (1kHz/10kHz signal in normal speed mode) and adjust so that the output difference of the LINE OUT outputs is -1~-1.5dB.

6. Deck I track B (B side) PB frequency characteristics adjustment in the high speed mode

Settings: Test tape: TTA-371, TTA-119J
Dubbing switch: A + B
Adjustment location: SFR115 (L-ch), SFR116 (R-ch)

Method: Load a test tape TTA-371 in Deck I. Load TTA-119J in Deck II, record/play the 1kHz signal and adjust so that the LINE OUT output is 0±$^{0.5}_{0.5}$dB.

Rating: CrO_2 tape (TTA-119G): 0±$^{0.5}_{2.5}$dB
METAL tape (TTA-119MX): 0±$^{0.5}_{2.5}$dB

13. Track B (B side) high speed dubbing record/play sensitivity adjustment

Settings: Test tape: TTA-171, TTA-119J
Dubbing switch: A + B
Adjustment location: SFR113 (L-ch), SFR114 (R-ch)

Method: Load a test tape with track B facing upward in Deck I and set the dubbing switch to A + B. Play back the 2kHz signals (high speed mode) (1kHz signals in the normal speed mode), and adjust so that the LINE OUT output is 340~360mV.

LI01
SFR106 SFR102
SFR104
SFR105 SFR101
SFR103
SFR110 SFR112
SFR109
SFR111
SFR116 SFR114
SFR115 SFR113
TP3,4,5

TP3: Play frequency characteristics test point during the track B (B side) high speed mode.

TP4: Play frequency characteristics test point during the track B (B side) high speed mode.

TP5: Play frequency characteristics test point during the track B (B side) high speed mode.

TP6: Bias oscillation frequency test point.

TP7: Erase current test point.

2. Tape speed adjustment

Settings: Test point: TP1, TP2

	High speed	Normal speed
Test tape	TTA-111H	TTA-111S
Dubbing switch	B, (A+B)	A
Adjustment location (Deck I)	SFR502	SFR into Motor
Adjustment location (Deck II)	SFR501	SFR into Motor

Method: [Deck I]
· High speed: Load TTA-111H, set to the play mode and set the dubbing switch to "HIGH SPEED". Adjust SFR 502 so that the speed is set to -0.8 ~ -0.5%.
· Normal speed: Load TTA-111S, set to the play mode and set the dubbing switch to "NORMAL SPEED". Adjust SFR502 so that the speed is set to -0.8 ~ -0.5%.

[Deck II]
· High speed: Load TTA-111H, set to the play mode and set the dubbing switch to "HIGH SPEED". Adjust SFR 501 so that the speed is set to -0.8 ~ -0.5%.
· Normal speed: Load TTA-111S, set to the play mode and set the dubbing switch to "NORMAL SPEED". Adjust SFR of M3 so that the speed is set to -0.8 ~ -0.5%.

A B
SFR502
SFR501
D528/R597
D519/R585
test point.
MI

1
A
B
C
D
E
F
G
H
I
J

BDOLE
CDOLE

⊕Vcc
GND
REC IN
P.B IN
⊖Vcc
⊕Vcc'
GND
REC IN'
P.B IN'
⊖Vcc'
DOLB

PB frequency characteristics adjust-
ode

TTA-317H (or TTA-317E)
: B

SFR101 (L-ch), SFR102 (R-ch)
pe in Deck I and set the dubbing
or short-circuit the test pin. Play
z/20kHz signal (high speed mode).
signal in normal speed mode) and
the output difference of the LINE
-1~-1.5dB.

PB frequency characteristics adjust-
ode

TTA-371, TTA-119J
: A + B

SFR115 (L-ch), SFR116 (R-ch)
TTA-371 in Deck I.
in Deck II, record/play the 1kHz
so that the LINE OUT output is

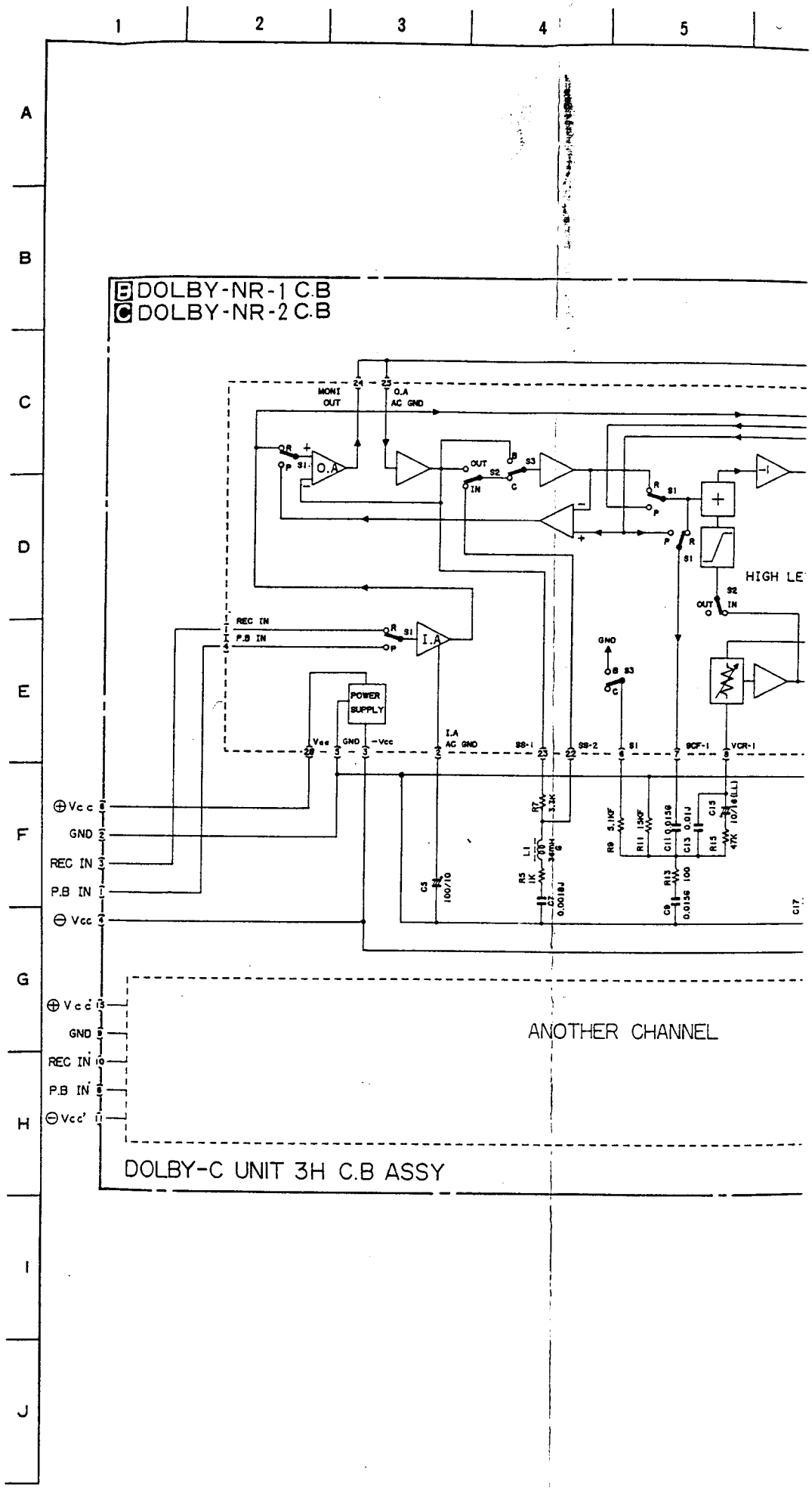
-119G): $0\pm^{2}_{2.5}$ dB
TA-119MX): $0\pm^{2}_{2.5}$ dB

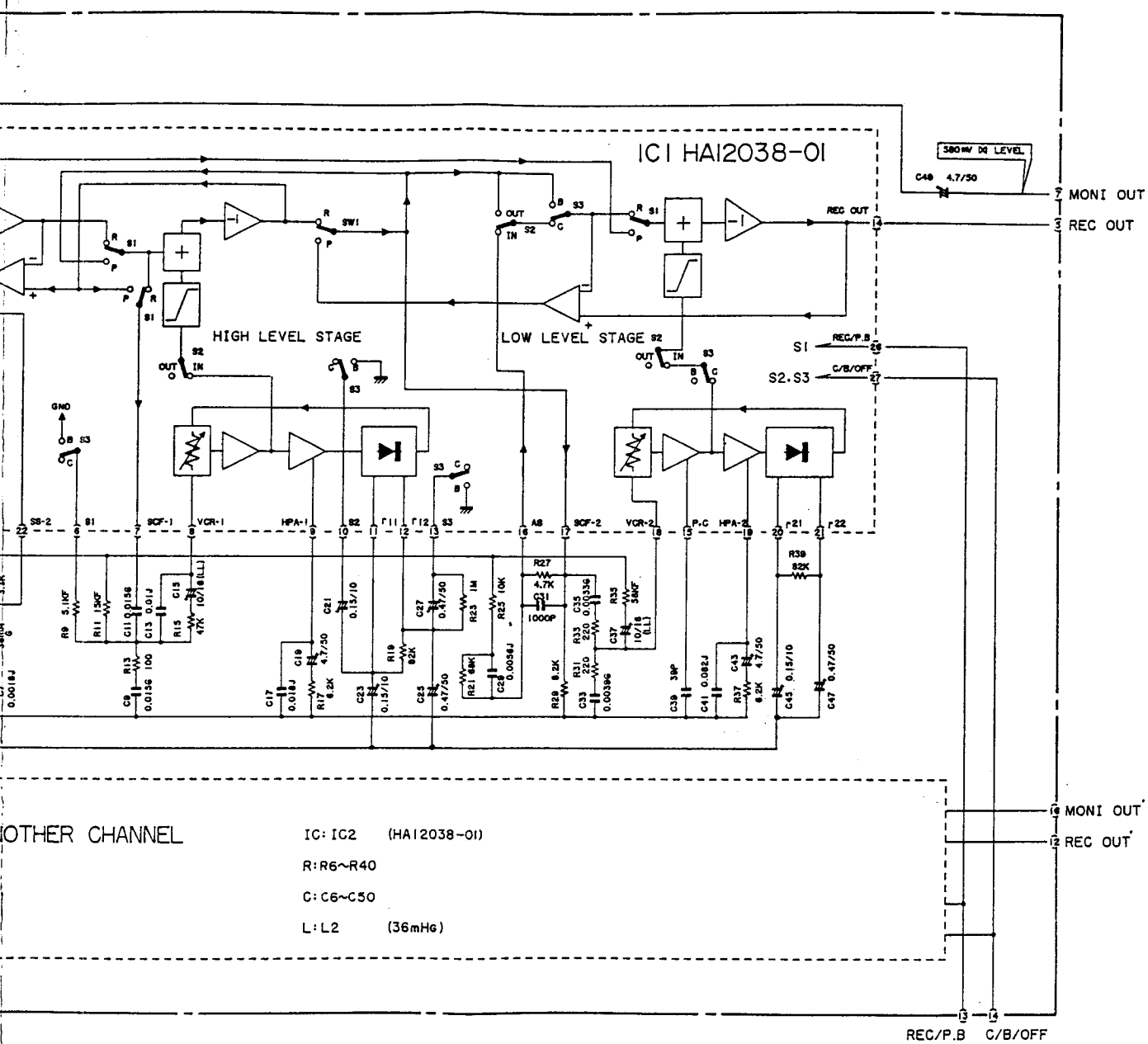
eed dubbing record/play sensitivity

TTA-171, TTA-119J
A + B

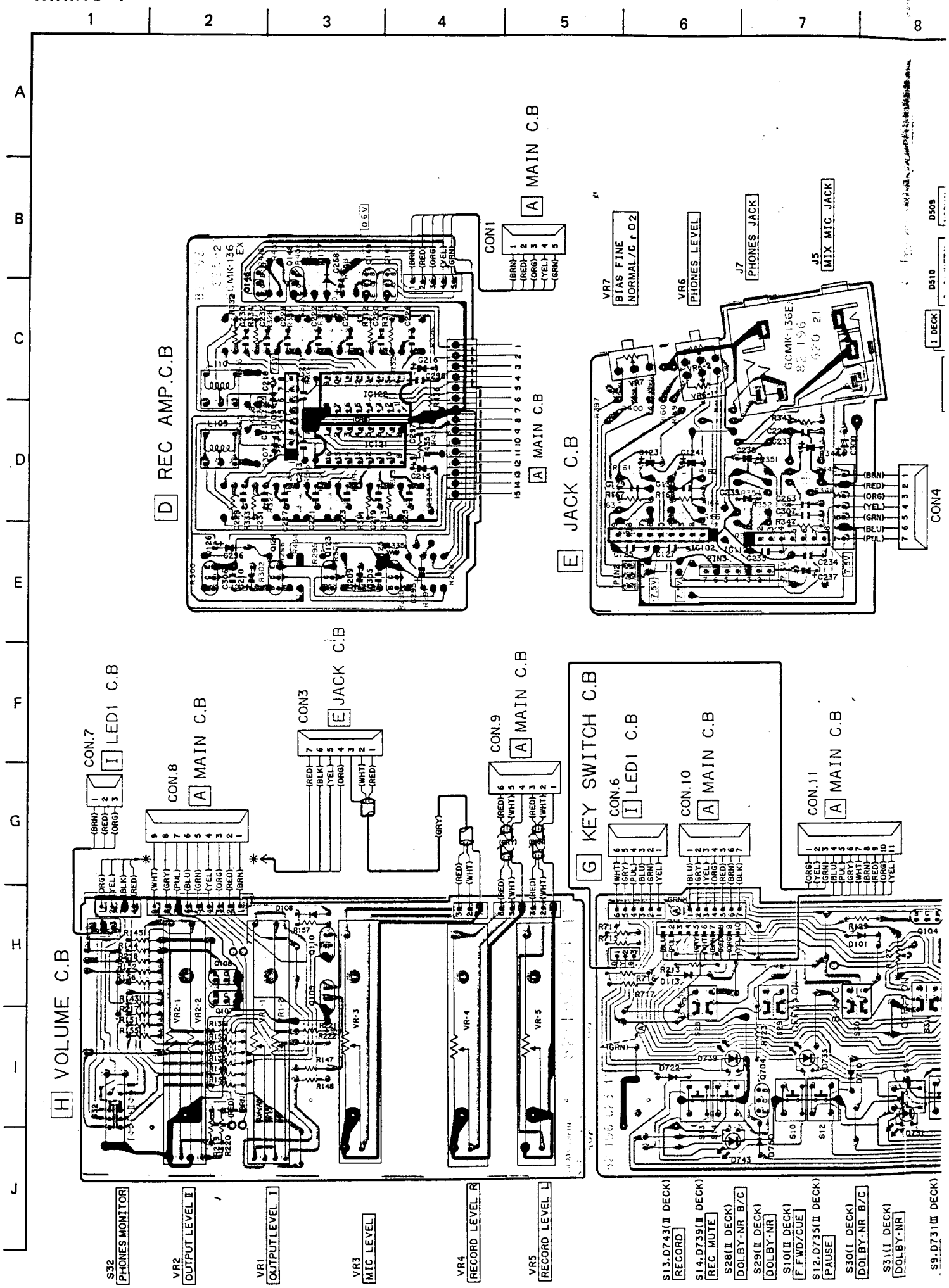
SFR113 (L-ch), SFR114 (R-ch)
with track B facing upward in Deck
ubbing switch to A + B. Play back
(high speed mode) (1kHz signals in
d mode), and adjust so that the
ut is 340~360mV.

SCHEMATIC DIAGRAM–3




IC1 HAI2038-01
380mV DC LEVEL
C49 4.7/50
MONI OUT
REC OUT
HIGH LEVEL STAGE
LOW LEVEL STAGE
REC OUT
S1
REC/P.B
S2.S3
C/B/OFF
SW1
S2
S3
GND
SB-2
SCF-1
VCR-1
HPA-1
AS
SCF-2
VCR-2
P.C
HPA-2
R27 4.7K
C34 1000P
R39 82K
OTHER CHANNEL
IC: IC2 (HAI2038-01)
R: R6~R40
C: C6~C50
L: L2 (36mHg)
MONI OUT'
REC OUT'
REC/P.B
C/B/OFF

NOTES (1) Earth pattern Printed resistor pattern
(2) The voltage is the reference value measured with a
An asterisk (*) indicates that the value was measure



Earth pattern Printed resistor pattern Others pattern

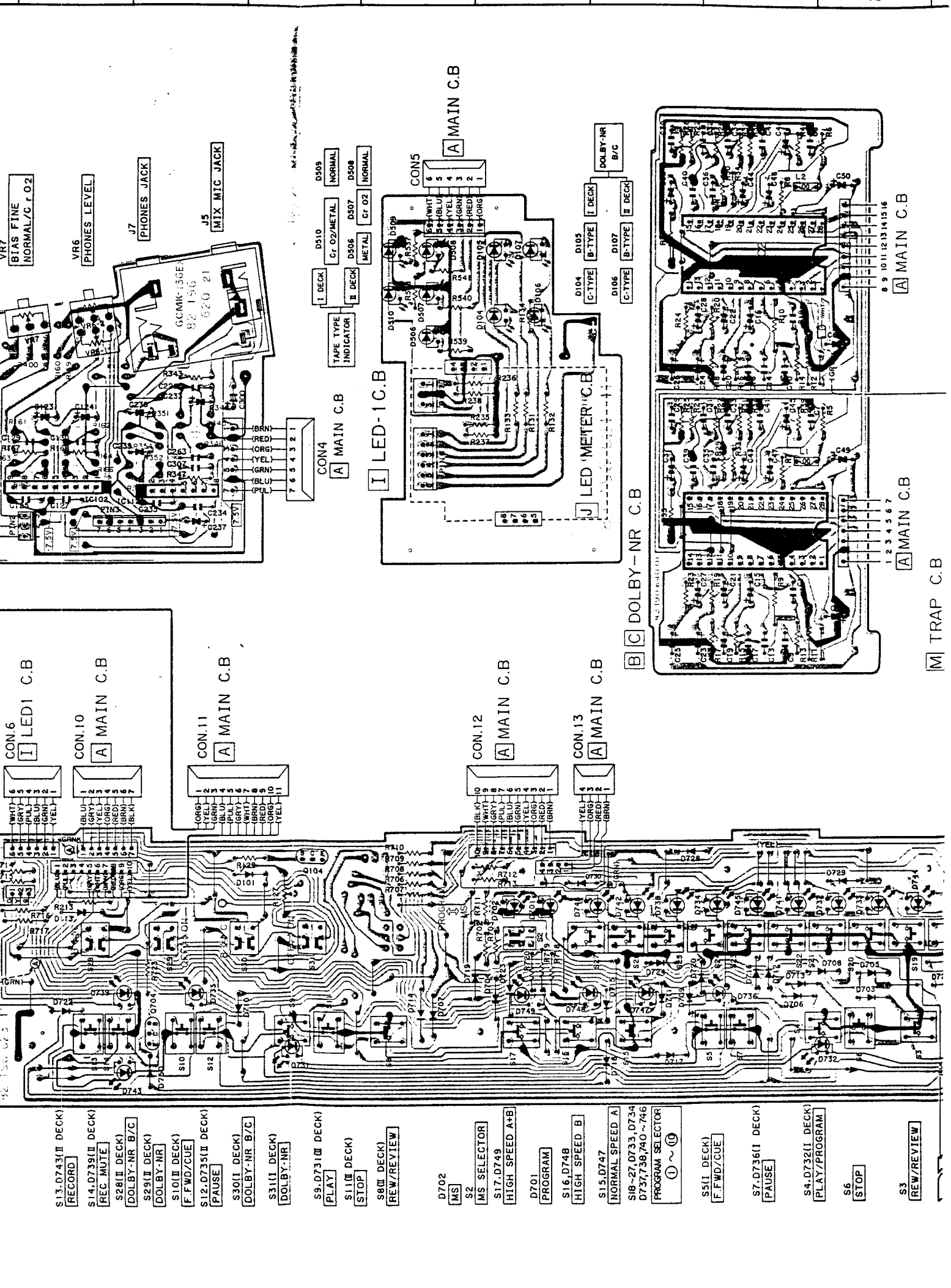
The voltage is the reference value measured with a tester (20 K ohms/V DC) when there are no signals.

An asterisk (*) indicates that the value was measured with a vacuum-tube voltmeter during recording.

⚠ Safety componen

This symbol is given t

the safety of the produc

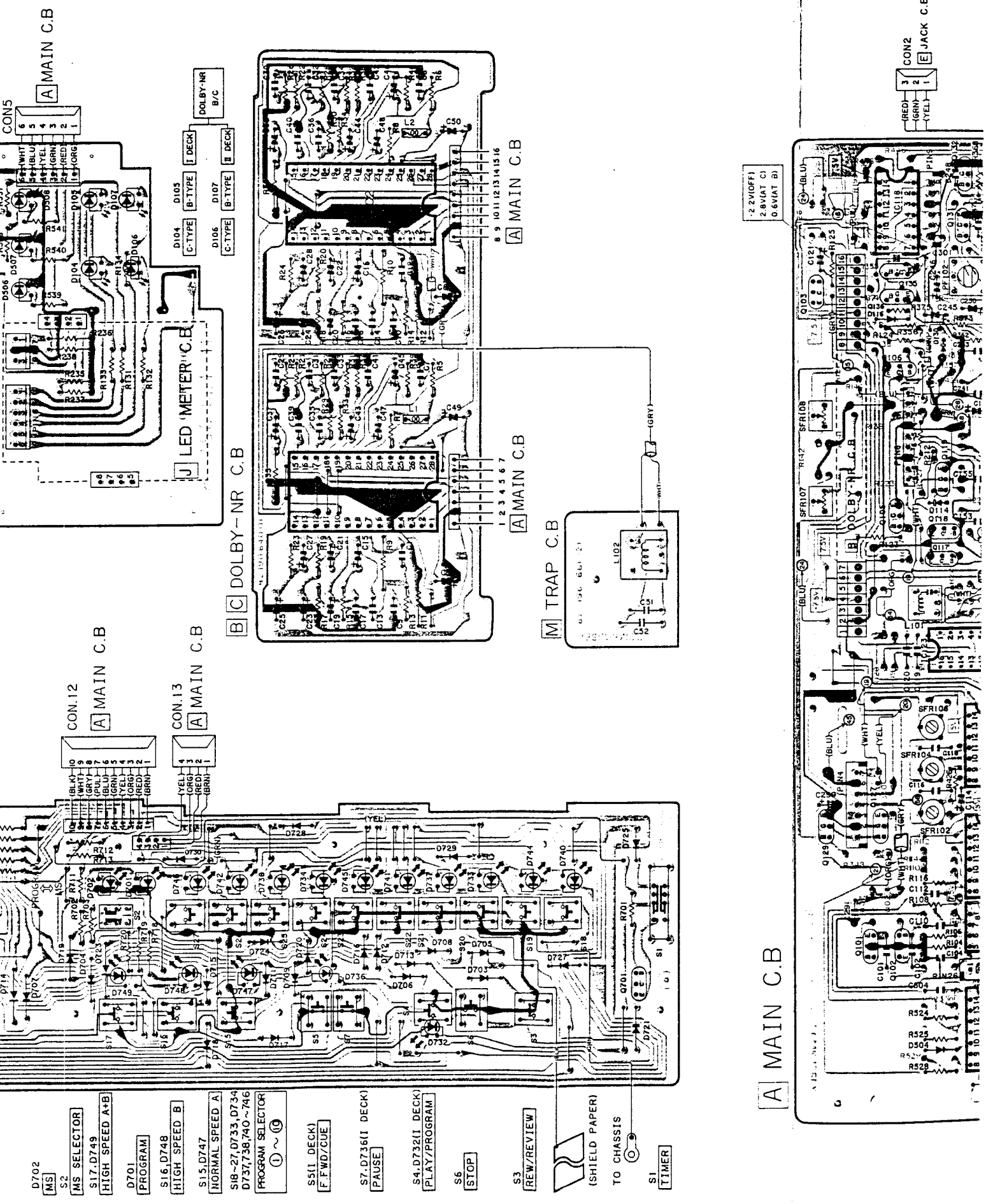


s pattern
ohms/V DC) when there are no signals.
cuum-tube voltmeter during recording.

⚠ Safety component symbol
This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special

safety specifications
this symbol, make a

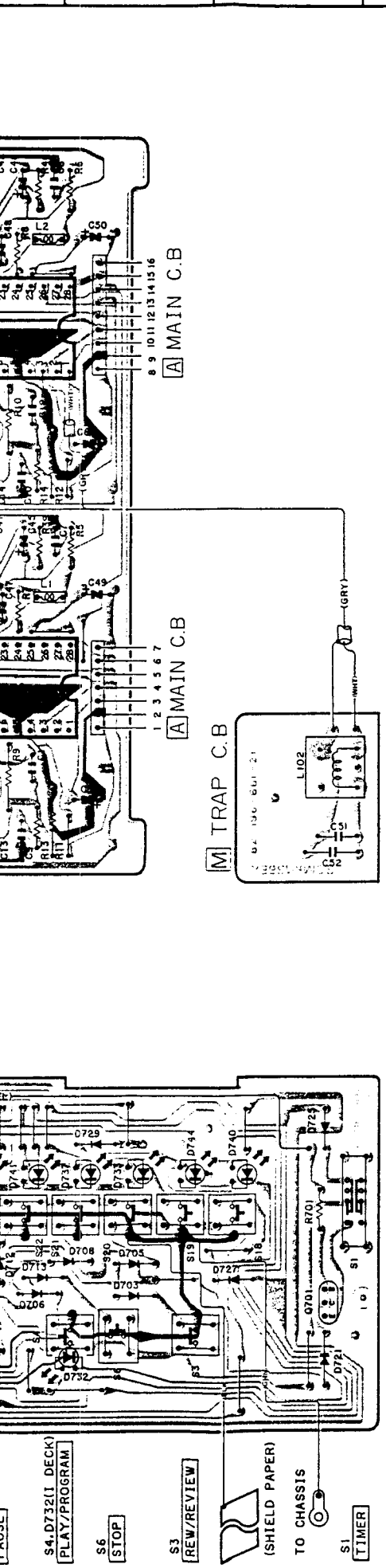
9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17



⚠ Safety component symbol

This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.

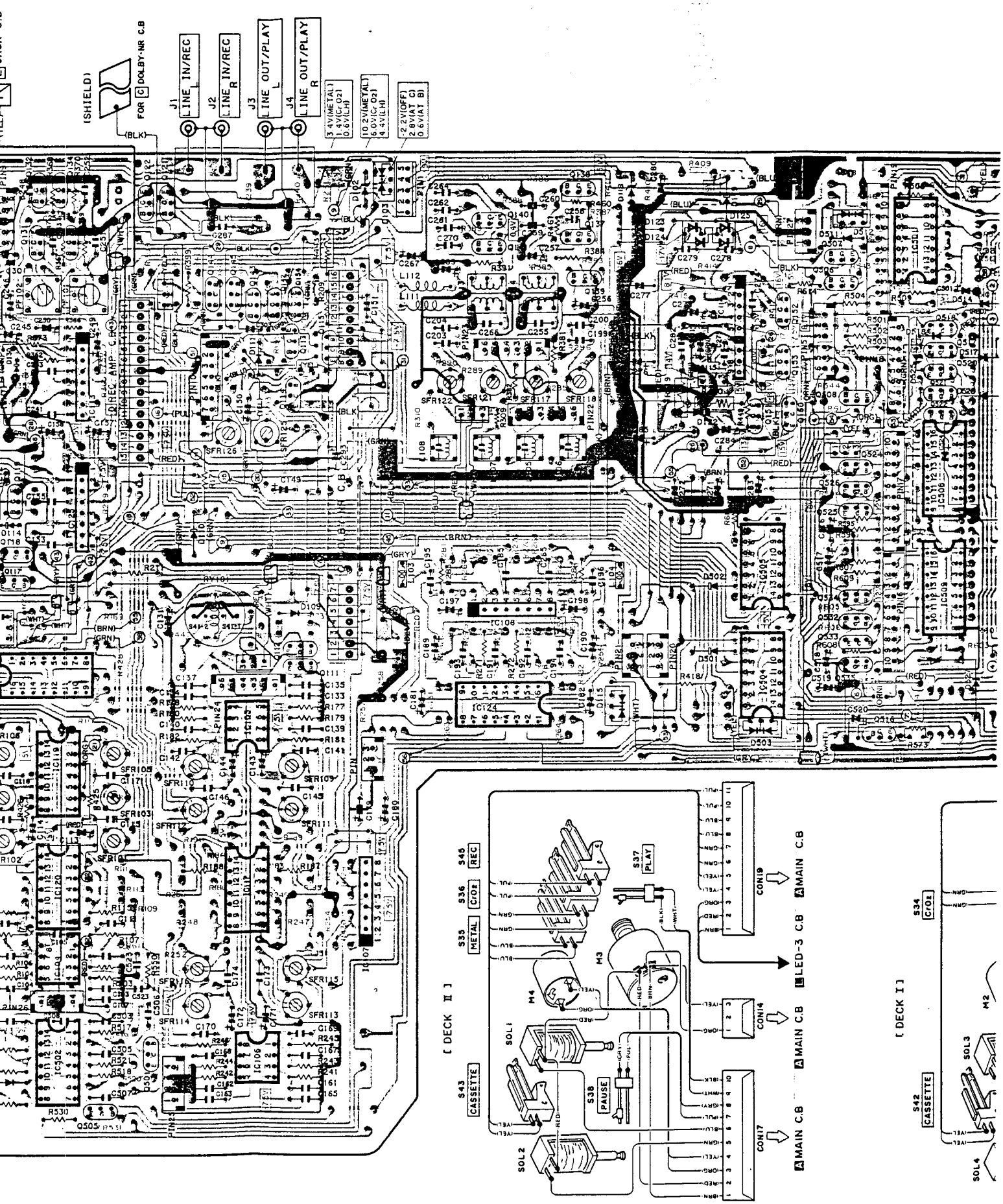
● The I
MOS

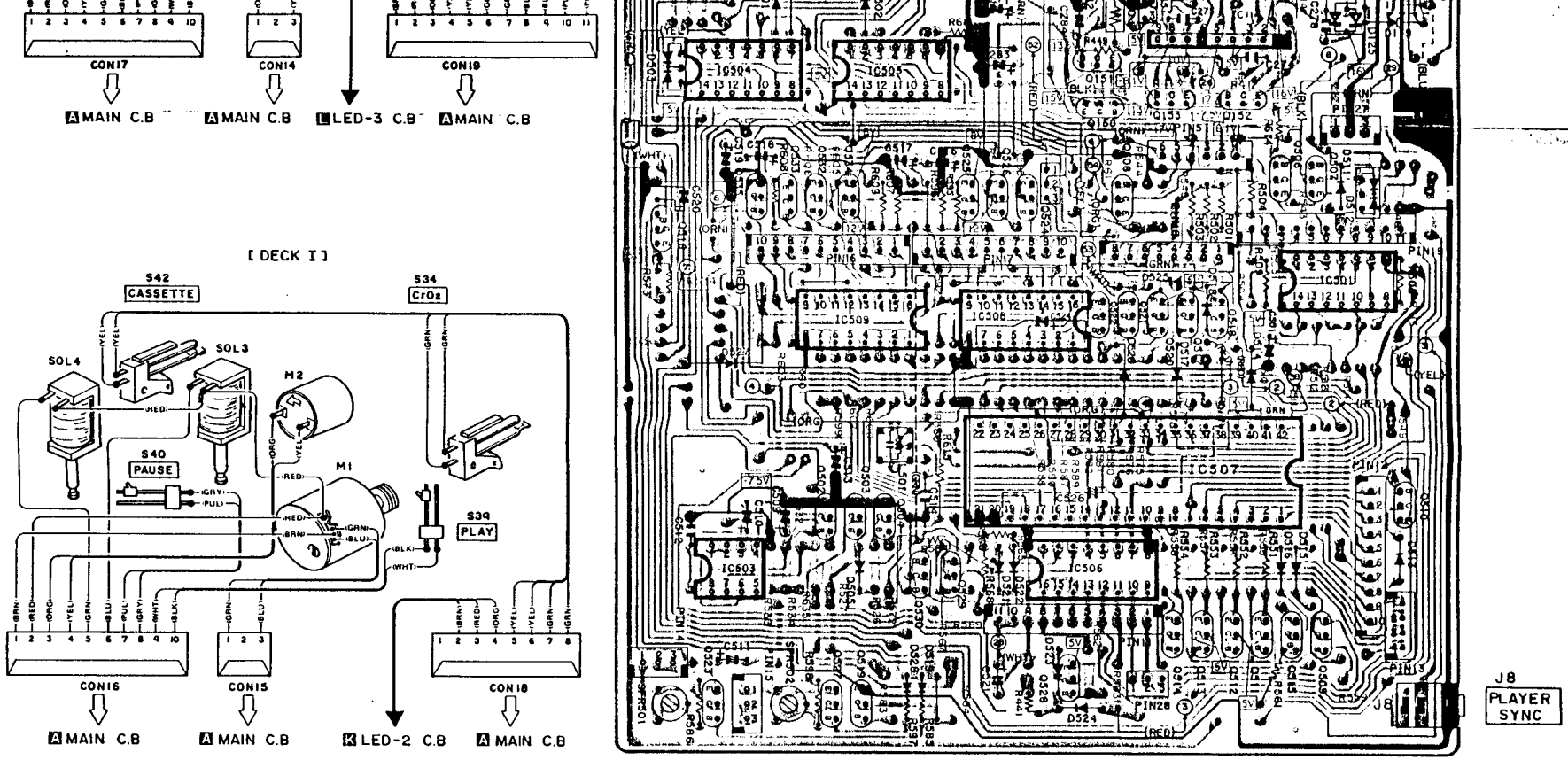


cifications. Therefore, when replacing a component with
ol, make absolutely sure that you use a designated part.

- The ICs on the electrical parts which are indicated by an C MOS IC symbol mark (⏚).

17 | 18 | 19 | 20 | 21 | 22 | 23 | 24





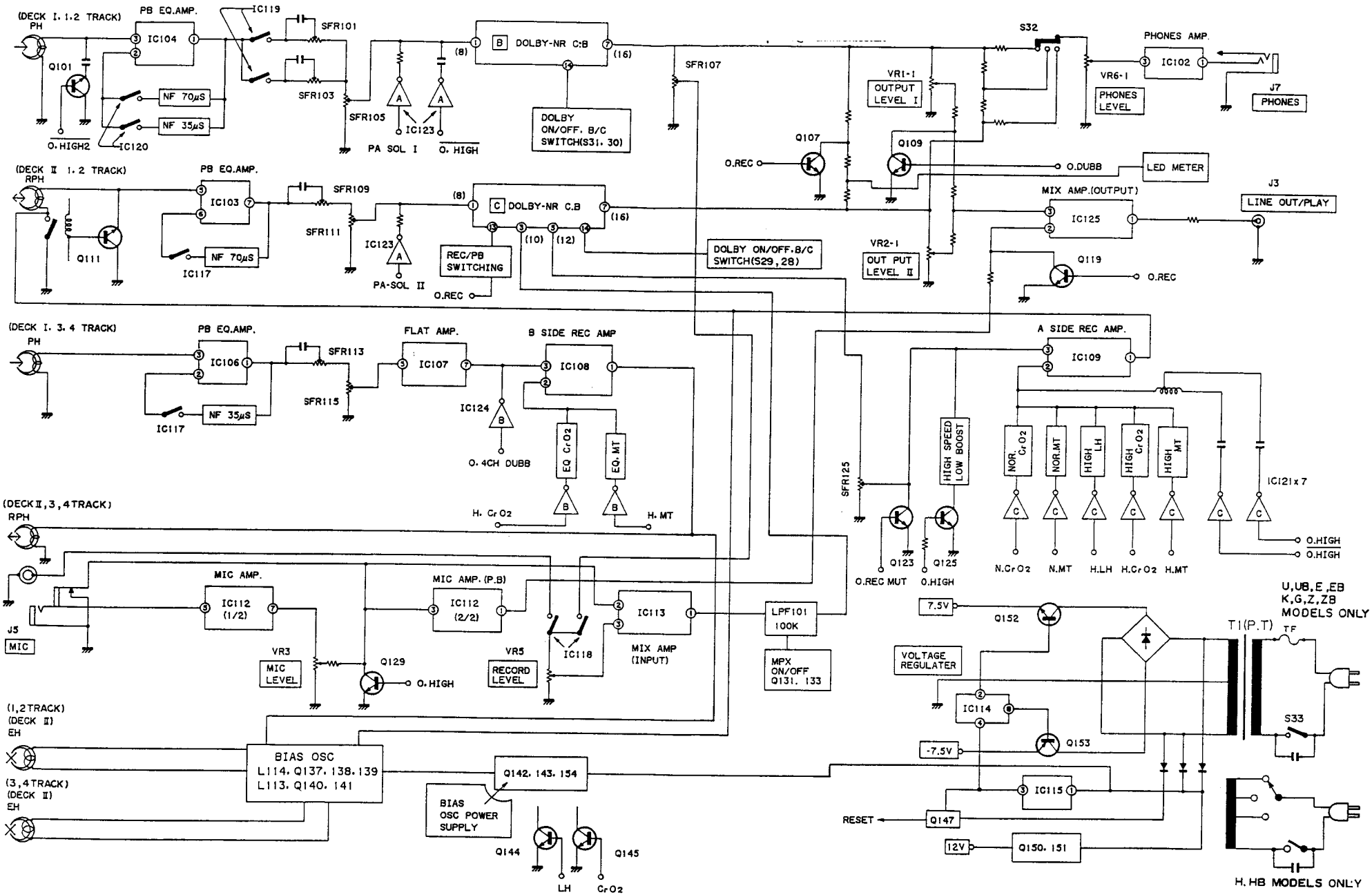
1 Azimuth adjustment
Setting : · Test tape : TTA-117E
· Adjustment location : Azimuth adjusting screw.

ted by an C-

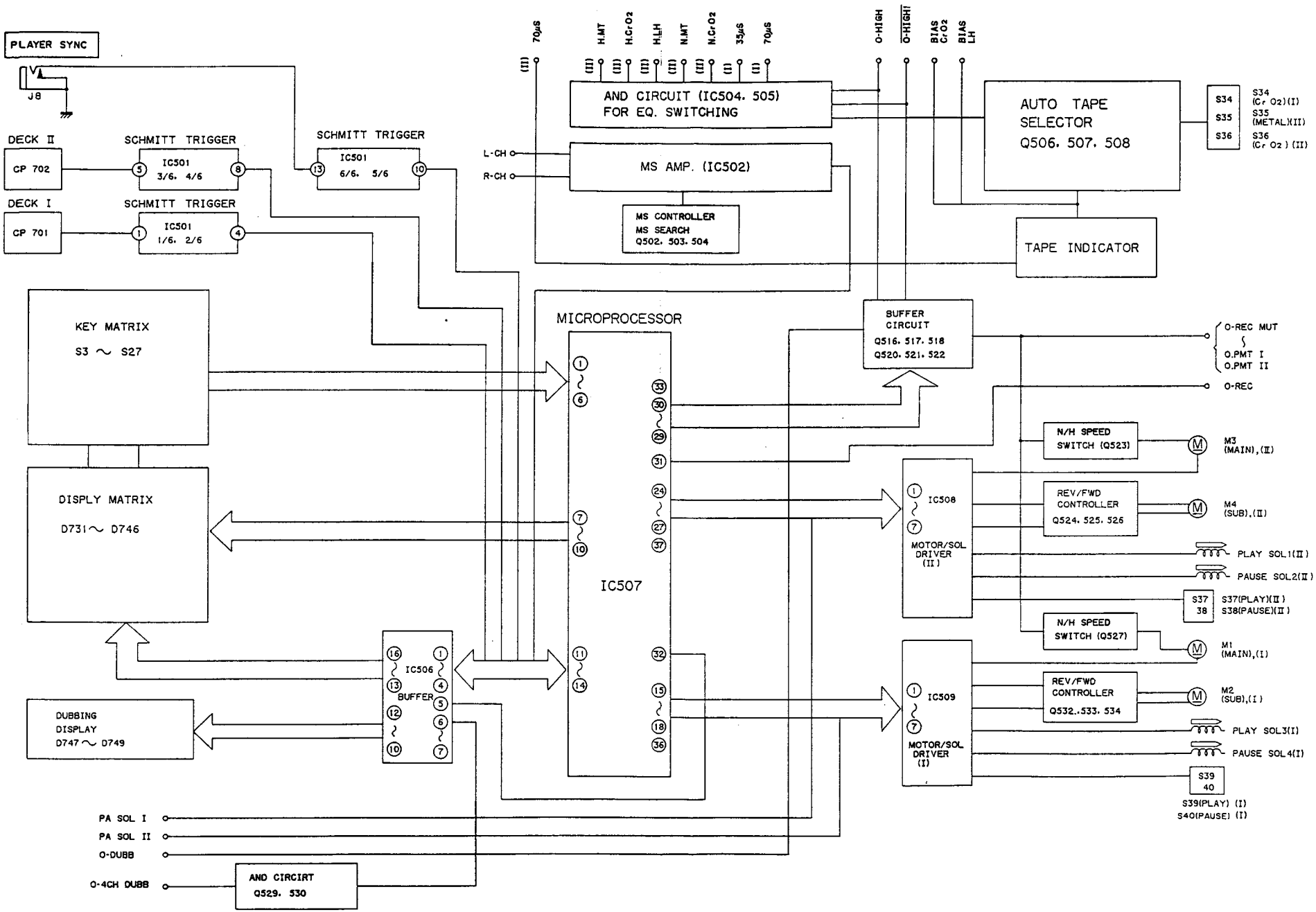
23 24 25 26 27 28 29 30

AU-WX22U[illegible]
EB,K,G,ZZB
3/
S/M Code No. 83-021

BLOCK DIAGRAM—1



BLOCK DIAGRAM-2



ELECTRICAL MAIN PARTS LIST

Symbol No.	Part No.	Description
≪MAIN CIRCUIT BOARD SECTION≫		
PCB-A	*	Main circuit board
IC103, 104, 106	87-027-814-01	IC, NJM4562D-D
IC107, 108, 113, 125	87-027-895-01	IC, M5218L
IC114	87-027-986-01	IC, NJM4560S
IC115	87-020-111-01	IC, L78M05
IC117, 118, 119, 120	87-020-096-01	IC, M4066BP
IC123, 124	87-027-948-01	IC, M54514AP
IC501, 502	87-027-538-01	IC, μPD4069
IC503	87-027-739-01	IC, NJM4556D-D
⚡IC504, 505	87-027-565-01	IC, CMOS TC4081BP
IC506	87-027-840-01	IC, M54519P
⚡IC507	82-196-601-01	IC, LC-6502C
IC508, 509	87-027-909-01	IC, M54523P
Q101, 102, 103, 114, 115, 127, 131, 132, 133, 134, 135, 136, 142, 144, 145, 151, 502, 503, 504, 509, 510, 511, 512, 513, 514, 515, 519, 530, 535	89-318-155-01	Transistor, 2SC1815 (GR)
Q105, 106, 117, 118, 119, 121, 122, 129, 137, 138, 139, 140, 141, 523, 527	89-320-011-01	Transistor, 2SC2001 (K)
Q111, 112	89-406-555-01	Transistor, 2SD655E
Q113, 143, 501, 505, 506, 507, 508, 516, 517, 518, 520, 521, 522, 528, 529	89-110-155-01	Transistor, 2SA1015 (GR)
Q150	89-408-804-51	Transistor, 2SD880 (Y, GR) (U, UB, G, Z, ZB models only)
Q150	89-412-653-41	Transistor, 2SD1265 (OP) (H, HB, E, EB, K models only)
Q152	89-318-464-51	Transistor, 2SC1846R (R, S) (H, HB, U, UB, G models only)
Q152	89-325-906-71	Transistor, 2SC2590 (R, S) (E, EB, K, Z, ZB models only)
Q153	89-108-854-51	Transistor, 2SA885R (R, S)
Q154	89-408-805-01	Transistor, 2SD880 (GR)
Q524, 526, 532, 533	89-109-521-01	Transistor, 2SA952K
Q525, 534	89-408-804-51	Transistor, 2SD880Y (Y, GR)
D102	87-027-606-01	Zener diode, HZ7C2L
D103, 115, 503, 512	87-020-095-01	Diode, MC921
D109, 111, 116. 130.	87-027-097-01	Diode, IS1555
D114	87-027-301-01	Zener diode, HZ3A1
D118	87-027-555-01	Zener diode, HZ5C2
D119	87-020-123-01	Diode, DS446
D122	87-027-283-01	Zener, diode, 05Z13U
D123, 124	87-027-537-01	Diode, S5277B LB
D125	87-027-376-01	Diode, 1B4B41
D526	88-052-188-11	Diode, 1S188FM
L101, 102, 105, 106, 107, 108	82-196-603-01	Trap coil, 100μH
L103, 104	87-003-091-01	Coil, 2.2mH
L111, 112	87-003-051-01	Choke coil, 470μH
L113	82-196-605-01	OSC coil, A2
L114	82-196-606-01	OSC coil, B2
L501	82-196-649-01	OSC coil, LC6502C
LPF101, 102	82-196-657-01	Low-pass fiber, LP100K
RY101	87-045-202-01	Lead relay, RP-13A
J8	87-049-054-01	Jack, 2.5φ (PLAYER SYNC)
J1, 2, 3, 4	87-049-301-01	Pin jack, 4P (LINE IN/REC L, LINE IN/REC R, LINE OUT/ PLAY L, LINE OUT/PLAY R)
SFR101, 102, 103, 104, 109, 110, 113, 114, 117, 118, 121, 122	87-021-745-01	Semi-fixed resistor, 47kΩ-B
SFR105, 106, 111, 112, 115, 116, 125, 126	87-021-744-01	Semi-fixed resistor, 33kΩ-B
SFR107, 108	87-021-634-01	Semi-fixed resistor, 10kΩ-B
SFR501, 502	87-021-735-01	Semi-fixed resistor, 220Ω-B
PIN	87-033-144-01	Pin
PIN	82-196-656-01	Pin, 3P
PIN1	87-049-275-01	Pin, 5P
PIN2, 14, 15, 20, 21, 27, 28	87-049-273-01	Pin, 3P
PIN3, 4, 10	87-049-277-01	Pin, 7P
PIN5, 9, 22, 23, 24	87-049-276-01	Pin, 6P
PIN8	87-049-279-01	Pin, 9P
PIN11, 19	87-049-281-01	Pin, 11P
PIN12, 16, 17	87-049-280-01	Pin, 10P
PIN13, 25, 26	87-049-274-01	Pin, 4P
PIN18	87-049-278-01	Pin, 8P
CON2	82-196-639-01	Connector ass'y, 3P
CON16	82-196-629-01	Connector ass'y, 10P
CON17	82-196-635-01	Connector ass'y, 10P
CON18	82-196-628-01	Connector ass'y, 8P
CON19	82-196-634-01	Connector ass'y, 11P
CON29	82-196-653-01	Connector ass'y, 3P
		< Resistors >
⚠R419	87-029-367-01	15Ω 1/2W Fuse resistor

Symbol No.	Part No.	Description
501, 502, 504, 505, 511, 513, 514, 515, 516, 517, 518, 519, 521, 522, 523, 524, 527, 528		
D114	87-027-301-01	Zener diode, HZ3A1
D118	87-027-555-01	Zener diode, HZ5C2
D119	87-020-123-01	Diode, DS446
D122	87-027-283-01	Zener, diode, 05Z13U
D123, 124	87-027-537-01	Diode, S5277B LB
D125	87-027-376-01	Diode, 1B4B41
D526	88-052-188-11	Diode, 1S188FM
L101, 102, 105, 106, 107, 108	82-196-603-01	Trap coil, 100μH
L103, 104	87-003-091-01	Coil, 2.2mH
L111, 112	87-003-051-01	Choke coil, 470μH
L113	82-196-605-01	OSC coil, A2
L114	82-196-606-01	OSC coil, B2
L501	82-196-649-01	OSC coil, LC6502C
LPF101, 102	82-196-657-01	Low-pass fiber, LP100K
RY101	87-045-202-01	Lead relay, RP-13A
J8	87-049-054-01	Jack, 2.5φ (PLAYER SYNC)
J1, 2, 3, 4	87-049-301-01	Pin jack, 4P (LINE IN/REC L, LINE IN/REC R, LINE OUT/PLAY L, LINE OUT/PLAY R)
SFR101, 102, 103, 104, 109, 110, 113, 114, 117, 118, 121, 122	87-021-745-01	Semi-fixed resistor, 47kΩ-B
SFR105, 106, 111, 112, 115, 116, 125, 126	87-021-744-01	Semi-fixed resistor, 33kΩ-B
SFR107, 108	87-021-634-01	Semi-fixed resistor, 10kΩ-B
SFR501, 502	87-021-735-01	Semi-fixed resistor, 220Ω-B
PIN	87-033-144-01	Pin
PIN	82-196-656-01	Pin, 3P
PIN1	87-049-275-01	Pin, 5P
PIN2, 14, 15, 20, 21, 27, 28	87-049-273-01	Pin, 3P
PIN3, 4, 10	87-049-277-01	Pin, 7P
PIN5, 9, 22, 23, 24	87-049-276-01	Pin, 6P
PIN8	87-049-279-01	Pin, 9P
PIN11, 19	87-049-281-01	Pin, 11P
PIN12, 16, 17	87-049-280-01	Pin, 10P
PIN13, 25, 26	87-049-274-01	Pin, 4P
PIN18	87-049-278-01	Pin, 8P
CON2	82-196-639-01	Connector ass'y, 3P
CON16	82-196-629-01	Connector ass'y, 10P
CON17	82-196-635-01	Connector ass'y, 10P
CON18	82-196-628-01	Connector ass'y, 8P
CON19	82-196-634-01	Connector ass'y, 11P
CON29	82-196-653-01	Connector ass'y, 3P
		< Resistors >
⚠R419	87-029-367-01	15Ω 1/2W Fuse resistor
⚠R420	87-029-108-01	1Ω 1/2W Fuse resistor
⚠R443	87-029-089-01	4.7Ω 1/4W Fuse resistor
		< Capacitors >
C111, 112, 141, 142, 169, 170	87-014-119-01	0.027μF PP
C113, 114, 143, 144, 171, 172	87-015-425-01	1μF 25V Aluminum solid
C251, 252	87-014-055-01	820pF PP
C255, 266	82-304-706-01	2200pF 630V PP
≪ DOLBY-NR CIRCUIT BOARD SECTION ≫		
	82-191-630-01	Dolby-unit (W/PCB-B, C)
≪ REC AMP CIRCUIT BOARD SECTION ≫		
PCB-D	*	REC AMP circuit board
IC109	87-027-895-01	IC, M5218L
IC121, 122	87-027-948-01	IC, M54514AP
Q123, 124	89-320-011-01	Transistor, 2SC2001 (K)
Q125, 126, 147, 148, 149	89-318-155-01	Transistor, 2SC1815 (GR)
Q146	89-110-155-01	Transistor, 2SA1015 (GR)
D117	87-027-097-01	Diode, 1S1555
L109, 110	82-196-604-01	Coil, 2.2/6.8mH
CON1	82-196-655-01	Connector ass'y, 5P
	82-188-618-01	Pin, 5P
≪ JACK CIRCUIT BOARD SECTION ≫		
PCB-E	*	Jack circuit board
IC102	87-020-052-01	IC, NJM4556S
IC112	87-027-895-01	IC, M5218L
J5, 7	82-196-602-01	Jack, 6.3φ (MIX MIC, PHONES)
VR6-1, 6-2	82-196-610-01	Volume, 10kΩ-A (PHONES LEVEL)
VR7	82-196-611-01	Volume, 10kΩ-B (BIAS FINE NORMAL/CrO_2)
CON4	82-196-654-01	Connector ass'y, 7P
≪ SWITCH CIRCUIT BOARD SECTION ≫		
PCB-F	*	Switch circuit board
⚠S33	87-031-753-01	Push switch (POWER)
	82-304-743-01	1P terminal
		< Capacitors >
⚠C1	87-019-110-01	0.01μF Spark killer (H, HB models only)
⚠C1	87-109-112-01	0.01μF Spark killer (U, UB, E, EB, K, Z, ZB models only)
≪ KEY SWITCH CIRCUIT BOARD SECTION ≫		
PCB-G	*	Key switch circuit board
Q104, 701, 704	89-406-365-01	Transistor, 2SD636 (S)
D101, 113, 703~730, 750	87-027-097-01	Diode, 1S1555
D701	87-020-091-01	LED, LN322GP (PROGRAM)
D702	87-020-092-01	LED, LN422YP (MS)
D731, 732	87-020-102-01	LED, GL-4PG5 (II DECK PLAY, I DECK/PROGRAM)
D733, 734, 737, 738, 740, 741, 742, 744, 745, 746	87-020-093-01	LED, LN222RP (PROGRAM 1~10)
D735, 736	87-020-103-01	LED, GL-4HY5 (I, II DECK PAUSE)

Sym

D739,

D747, 749

S1

S2, 28

30, 3

S3, 4, 8, 9, 12, 1 15, 18, 1 21, 2 24, 2 27

CONE CON1 CON1 CON1 CON1

≪ VC

PCB-I Q107 Q109 D108

S32

VR1- 2-

VR3

VR4

CON CON CON CON

≪ L

PCB- D10- 50 D10 50 D50 CON PINE PIN

≪ L

≪ L PCE CP-

≪ L PCE CP7

Symbol No.	Part No.	Description
⚠R420	87-029-108-01	1Ω 1/2W Fuse resistor
⚠R443	87-029-089-01	4.7Ω 1/4W Fuse resistor
		< Capacitors >
C111, 112, 141, 142, 169, 170	87-014-119-01	0.027μF PP
C113, 114, 143, 144, 171, 172	87-015-425-01	1μF 25V Aluminum solid
C251, 252	87-014-055-01	820pF PP
C255, 266	82-304-706-01	2200pF 630V PP

≪ DOLBY-NR CIRCUIT BOARD SECTION ≫

	82-191-630-01	Dolby-unit (W/PCB-8, C)

≪ REC AMP CIRCUIT BOARD SECTION ≫

PCB-D	*	REC AMP circuit board
IC109	87-027-895-01	IC, M5218L
IC121, 122	87-027-948-01	IC, M54514AP
Q123, 124	89-320-011-01	Transistor, 2SC2001 (K)
Q125, 126, 147, 148, 149	89-318-155-01	Transistor, 2SC1815 (GR)
Q146	89-110-155-01	Transistor, 2SA1015 (GR)
D117	87-027-097-01	Diode, 1S1555
L109, 110	82-196-604-01	Coil, 2.2/6.8mH
CON1	82-196-655-01	Connector ass'y, 5P
	82-188-618-01	Pin, 5P

≪ JACK CIRCUIT BOARD SECTION ≫

PCB-E	*	Jack circuit board
IC102	87-020-052-01	IC, NJM4556S
IC112	87-027-895-01	IC, M5218L
J5, 7	82-196-602-01	Jack, 6.3φ (MIX MIC, PHONES)
VR6-1, 6-2	82-196-610-01	Volume, 10kΩ-A (PHONES LEVEL)
VR7	82-196-611-01	Volume, 10kΩ-B (BIAS FINE NORMAL/CrO_2)
CON4	82-196-654-01	Connector ass'y, 7P

≪ SWITCH CIRCUIT BOARD SECTION ≫

PCB-F	*	Switch circuit board
⚠S33	87-031-753-01	Push switch (POWER)
	82-304-743-01	1P terminal
		< Capacitors >
⚠C1	87-019-110-01	0.01μF Spark killer (H, HB models only)
⚠C1	87-109-112-01	0.01μF Spark killer (U, UB, E, EB, K, Z, ZB models only)

≪ KEY SWITCH CIRCUIT BOARD SECTION ≫

PCB-G	*	Key switch circuit board
Q104, 701, 704	89-406-365-01	Transistor, 2SD636 (S)
D101, 113, 703~730, 750	87-027-097-01	Diode, 1S1555
D701	87-020-091-01	LED, LN322GP (PROGRAM)
D702	87-020-092-01	LED, LN422YP (MS)
D731, 732	87-020-102-01	LED, GL-4PG5 (II DECK PLAY, I DECK/PROGRAM)
D733, 734, 737, 738, 740, 741, 742, 744, 745, 746	87-020-093-01	LED, LN222RP (PROGRAM 1~10)
D735, 736	87-020-103-01	LED, GL-4HY5 (I, II DECK PAUSE)
D739, 743	87-020-101-01	LED, GL-4PR5 (II DECK REC MUTE, RECORD)
D747, 748, 749	87-027-772-01	LED, GL-9PR4 (DUBBING A, B, A+B)
S1	87-031-807-01	Slide switch (TIMER)
S2, 28, 29, 30, 31	87-031-806-01	Push-switch (MS SELECTOR, II DECK Dolby-NR B/C ON/OFF, I DECK DOLBY-NR B/C, ON/OFF)
S3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27	87-031-771-01	Tact switch (I DECK REW/REV, I DECK PLAY/PROGRAM I DECK F. FWD/CUE, I DECK STOP, I DECK PAUSE, II DECK REW/REV, II DECK PLAY II DECK II DECK F. FWD/CUE, II DECK STOP, II DECK PAUSE, II DECK RECORD, II DECK REC MUTE, DUBBING A, B, A+B, PROGRAM 1, 2, 3, 4, 5, 6, 7, 8, 9, 10)
CON6	82-196-645-01	Connector ass'y, 6P
CON10	82-196-646-01	Connector ass'y, 7P
CON11	82-196-647-01	Connector ass'y, 11P
CON12	82-196-651-01	Connector ass'y, 10P
CON13	82-196-652-01	Connector ass'y, 4P

≪ VOLUME CIRCUIT BOARD SECTION ≫

PCB-H	*	Volume circuit board
Q107, 108	89-318-155-01	Transistor, 2SC1815 (GR)
Q109, 110	89-320-011-01	Transistor, 2SC2001 (K)
D108	87-027-097-01	Diode, 1S1555
S32	87-031-807-01	Slide switch (PHONES MONITOR)
VR1-1/1-2, 2-1/2-2	82-196-607-01	Slide volume, 10kΩ-A (OUTPUT LEVEL I DECK L/R, OUTPUT LEVEL II DECK L/R)
VR3	82-196-608-01	Slide volume, 10kΩ-A (MIC LEVEL)
VR4, 5	82-196-609-01	Slide volume, 30kΩ-A (RECORD LEVEL)
CON3	82-196-642-01	Connector ass'y, 7P
CON7	82-196-640-01	Connector ass'y, 3P
CON8	82-196-643-01	Connector ass'y, 9P
CON9	82-196-641-01	Connector ass'y, 6P

≪ LED-1 CIRCUIT BOARD SECTION ≫

PCB-I	*	LED-1 circuit board
D104, 106, 506, 510	87-027-542-01	LED, LN217RP (I, II DECK, C, METAL CrO_2/METAL)
D105, 107, 508, 509	87-027-543-01	LED, LN317GP (I, II DECK NORMAL)
D507	87-027-671-01	LED, LN417YP (II DECK, CrO_2)
CON5	82-196-644-01	Connector ass'y, 6P
PIN6	87-049-316-01	Pin, 6P
PIN7	87-049-068-01	Pin, 3P

≪ LED METER CIRCUIT BOARD SECTION ≫

	82-196-612-01	Indicator module (w/PCB-J)

≪ LED-2 CIRCUIT BOARD SECTION ≫

PCB-K	81-505-605-01	LED-2 circuit board
CP-701	87-027-644-01	Photo sensor, NJL-5141EA

≪ LED-3 CIRCUIT BOARD SECTION ≫

PCB-L	81-505-605-01	LED-3 circuit board
CP702	87-027-644-01	Photo sensor, NJL-5141EA

Symbol No.	Part No.	Description
D739, 743	87-020-101-01	LED, GL-4PR5 (II DECK REC MUTE, RECORD)
D747, 748, 749	87-027-772-01	LED, GL-9PR4 (DUBBING A, B, A+B)
S1	87-031-807-01	Slide switch (TIMER)
S2, 28, 29, 30, 31	87-031-806-01	Push-switch (MS SELECTOR, II DECK Dolby-NR B/C ON/OFF, I DECK DOLBY-NR B/C, ON/OFF)
S3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27	87-031-771-01	Tact switch (I DECK REW/REV, I DECK PLAY/PROGRAM I DECK F. FWD/CUE, I DECK STOP, I DECK PAUSE, II DECK REW/REV, II DECK PLAY II DECK II DECK F. FWD/CUE, II DECK STOP, II DECK PAUSE, II DECK RECORD, II DECK REC MUTE, DUBBING A, B, A+B, PROGRAM 1, 2, 3, 4, 5, 6, 7, 8, 9, 10)
CON6	82-196-645-01	Connector ass'y, 6P
CON10	82-196-646-01	Connector ass'y, 7P
CON11	82-196-647-01	Connector ass'y, 11P
CON12	82-196-651-01	Connector ass'y, 10P
CON13	82-196-652-01	Connector ass'y, 4P
≪ VOLUME CIRCUIT BOARD SECTION ≫		
PCB-H	*	Volume circuit board
Q107, 108	89-318-155-01	Transistor, 2SC1815 (GR)
Q109, 110	89-320-011-01	Transistor, 2SC2001 (K)
D108	87-027-097-01	Diode, 1S1555
S32	87-031-807-01	Slide switch (PHONES MONITOR)
VR1-1/1-2, 2-1/2-2	82-196-607-01	Slide volume, 10kΩ-A (OUTPUT LEVEL I DECK L/R, OUTPUT LEVEL II DECK L/R)
VR3	82-196-608-01	Slide volume, 10kΩ-A (MIC LEVEL)
VR4, 5	82-196-609-01	Slide volume, 30kΩ-A (RECORD LEVEL)
CON3	82-196-642-01	Connector ass'y, 7P
CON7	82-196-640-01	Connector ass'y, 3P
CON8	82-196-643-01	Connector ass'y, 9P
CON9	82-196-641-01	Connector ass'y, 6P
≪ LED-1 CIRCUIT BOARD SECTION ≫		
PCB-I	*	LED-1 circuit board
D104, 106, 506, 510	87-027-542-01	LED, LN217RP (I, II DECK, C, METAL CrO_2/METAL)
D105, 107, 508, 509	87-027-543-01	LED, LN317GP (I, II DECK NORMAL)
D507	87-027-671-01	LED, LN417YP (II DECK, CrO_2)
CON5	82-196-644-01	Connector ass'y, 6P
PIN6	87-049-316-01	Pin, 6P
PIN7	87-049-068-01	Pin, 3P
≪ LED METER CIRCUIT BOARD SECTION ≫		
	82-196-612-01	Indicator module (w/PCB-J)
≪ LED-2 CIRCUIT BOARD SECTION ≫		
PCB-K	81-505-605-01	LED-2 circuit board
CP-701	87-027-644-01	Photo sensor, NJL-5141EA
≪ LED-3 CIRCUIT BOARD SECTION ≫		
PCB-L	81-505-605-01	LED-3 circuit board
CP702	87-027-644-01	Photo sensor, NJL-5141EA

Symbol No.	Part No.	Description
≪ TRAP CIRCUIT BOARD SECTION ≫		
PCB-M	*	Trap circuit board
L3	82-371-622-01	Coil, 23mH
≪ MISCELLANEOUS ≫		
⚠T1	82-196-614-01	Power transformer (U, UB models only)
⚠T1	82-196-615-01	Power transformer (H, HB models only)
⚠T1	82-196-616-01	Power transformer (E, EB, Z, ZB models only)
⚠T1	82-196-617-01	Power transformer (K, G models only)
⚠S46	87-031-586-01	Rotary switch (VOLTAGE SELECTOR) (H, HB models only)
RPH	87-046-238-01	REC/PB head (II DECK)
EH	87-046-236-01	Erase head (II DECK)
PH	87-046-237-01	PB head (I DECK)
	82-598-622-01	Dummy head (I DECK)
SOL1, 2, 3, 4	81-507-237-01	Solenoid, 9ME-C
M1, 3	87-045-213-01	DC motor
M2, 4	81-505-604-11	Reel motor
D120	87-020-108-01	LED, SLF-601C
D121	87-020-109-01	LED, SLF-201C
S34, 36	81-505-602-01	Leaf switch (I DECK, II DECK CrO_2)
S35, 42, 43, 44, 45	81-505-607-01	Leaf switch (I DECK METAL, I DECK CASSETTE, II DECK CASSETTE, II DECK REC ENAB, II DECK REC ENAB)
S37, 38, 39, 40	81-505-601-01	Leaf switch (II DECK PLAY, II DECK PAUSE, I DECK PLAY, I DECK PAUSE)
⚠	87-034-958-01	AC power cord (H, HB models only)
⚠	87-034-951-01	AC power cord (U, UB models only)
⚠	87-034-877-01	AC power cord (E, EB, Z, ZB models only)
⚠	87-034-975-01	AC power cord (K model only)
⚠	87-034-892-01	AC power cord (G model only)
⚠	87-085-184-01	Cord bushing (H, HB, U, UB models only)
⚠	87-085-185-01	Cord bushing (E, EB, K, G, Z, ZB models only)
CON14	82-196-637-01	Connector ass'y, 3P
CON15	82-196-630-01	Connector ass'y, 3P
CON20, 21	82-196-638-01	Connector ass'y, 3P
CON22	82-196-632-01	Connector ass'y, 6P
CON23	82-196-633-01	Connector ass'y, 6P
CON24	82-196-631-01	Connector ass'y, 4P
CON25	82-196-627-01	Connector ass'y, 4P
CON26	82-196-626-01	Connector ass'y, 4P
CON28	82-196-636-01	Connector ass'y, 3P

⚠ Safety component symbol

This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.

C-MOS IC handling precaution

The C-MOS IC's construction makes this part susceptible to damage by static electricity and so take sufficient care in regard to following articles.

1. Need to be put on conductive sheet, to be put in a metallic box and to be wrapped by aluminium foil for transportation and deposit.
2. To use solder iron less than 40W (less than 260℃) of power consumption for soldering. But do not overheat more than 10 second.
3. Do not perform a conductivity test with a tester, etc. Refer to the circuit voltages of each part.
4. The ICs on the electrical parts which are indicated by an C-MOS IC symbol mark (ⓖ).

Note; Combination Circuit Board

The parts on the electrical parts list which are indicated by an asterisk (*) are supplied as one single combined circuit board. Therefore, they will not be supplied separately. If this becomes necessary, please order the entire circuit board.

Combination circuit board A 82-196-618-21

PCB-A 82-196-619-21
PCB-D 82-196-625-21
PCB-E 82-196-620-21
PCB-F 82-196-622-21
PCB-M 82-196-661-21

Combination circuit board B 82-196-648-11

PCB-G 82-196-623-11
PCB-H 82-196-624-11
PCB-I 82-196-621-11

• Ceramic capacitor

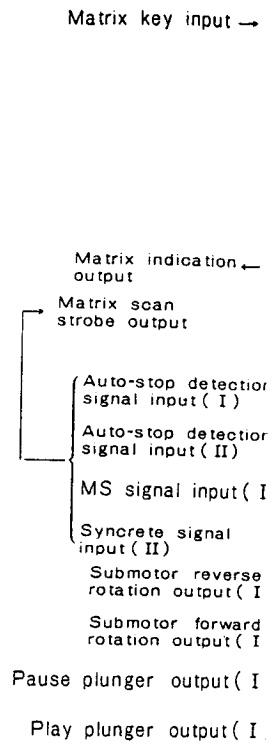
87-018-□□□-01

Capacitor	Part No.
27pF	018
100pF	032
150pF	034
180pF	035
270pF	037
390pF	039
680pF	042
1000pF	044
2200pF	045
4700pF	046
0.01μF	047

0.0015μF 89-663-635-010

DESCRIPTION OF IC

Description of IC LC6502


Matrix key input
Matrix indication output
Matrix scan strobe output
Auto-stop detection signal input (I)
Auto-stop detection signal input (II)
MS signal input (I
Syncrete signal input (II)
Submotor reverse rotation output (I
Submotor forward rotation output (I
Pause plunger output (I
Play plunger output (I

The directic
(Note) Both
side

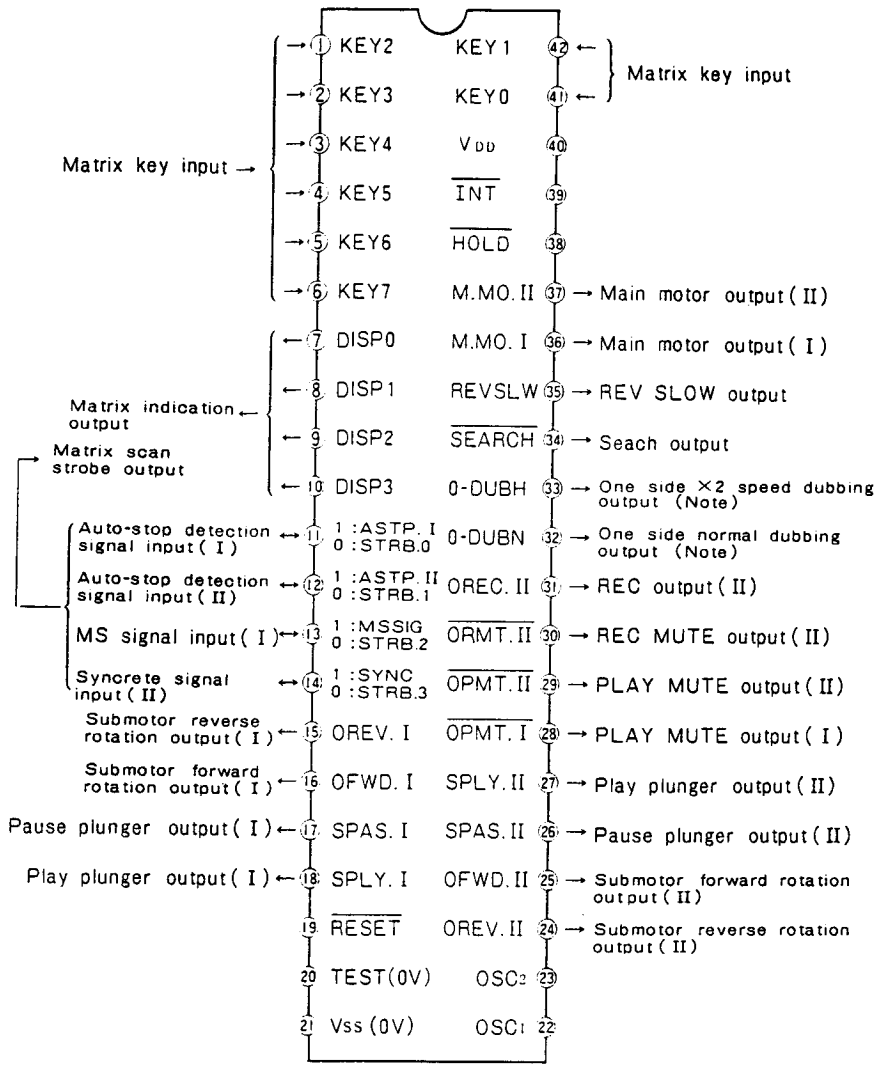
Description of pins

"H" level:

Pin No.	Terminal Symbol	When STRB 0 is set to "H" level
㊶	KEY 0	RWD key input (I)
㊷	KEY 1	PLAY key input (I)
①	KEY 2	FF key input (I)
②	KEY 3	STOP key input (I)
③	KEY 4	PAUSE key input (I)
④	KEY 5	Timer PLAY/REPEAT switch input (I)
⑤	KEY 6	Timer REC switch input (II)
⑥	KEY 7	Rear surface accidental erasure prevention key input (II)

DESCRIPTION OF IC PINS

Description of IC LC6502C



The direction of the arrow shows the signal flow.
(Note) Both pins ㉜, ㉝ are set to "H" level during both side × 2 speed dubbing.

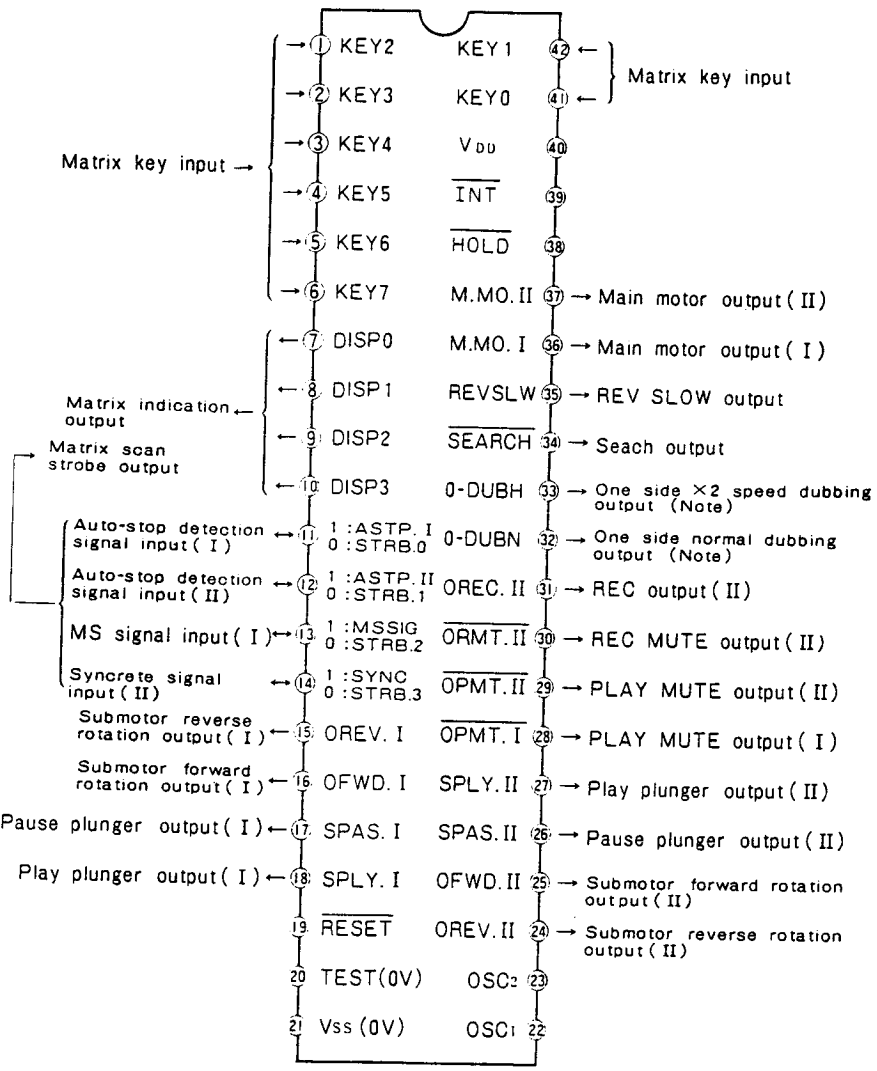
Description of pins

"H" level: +5[V], "L" level: 0[V] * OPMT I outputs "L" level during the MS

Pin No.	Terminal Symbol	Function			
		When STRB 0 is set to "H" level	When STRB 1 is set to "H" level	When STRB 2 is set to "H" level	When ST set to "
㊶	KEY 0	RWD key input (I)	RWD key input (II)	Cassette detection input (I)	MS key inpu
㊷	KEY 1	PLAY key input (I)	PLAY key input (II)	Cassette detection input (II)	MS key inpu
①	KEY 2	FF key input (I)	FF key input (II)	One side constant speed dubbing key input	MS key inpu
②	KEY 3	STOP key input (I)	STOP key input (II)	One side x2 speed dubbing key input	MS key inpu
③	KEY 4	PAUSE key input (I)	PAUSE key input (II)	MS select switch input	MS key inpu
④	KEY 5	Timer PLAY/REPEAT switch input (I)	REC key input (II)/Accidental erasure prevention key input (II)	Both side x2 speed dubbing key input	MS key inpu
⑤	KEY 6	Timer REC switch input (II)	REC MUTE key input (II)	MS key input No. 1	MS key inpu
⑥	KEY 7	Rear surface accidental erasure prevention key input (II)	Short-circuited by diode	MS key input No. 2	MS key inpu

PTION OF IC PINS

n of IC LC6502C



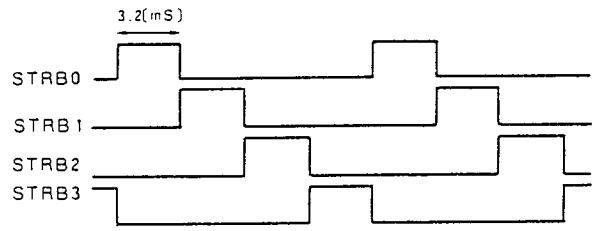
The direction of the arrow shows the signal flow.

(Note) Both pins ㉜, ㉝ are set to "H" level during both side × 2 speed dubbing.

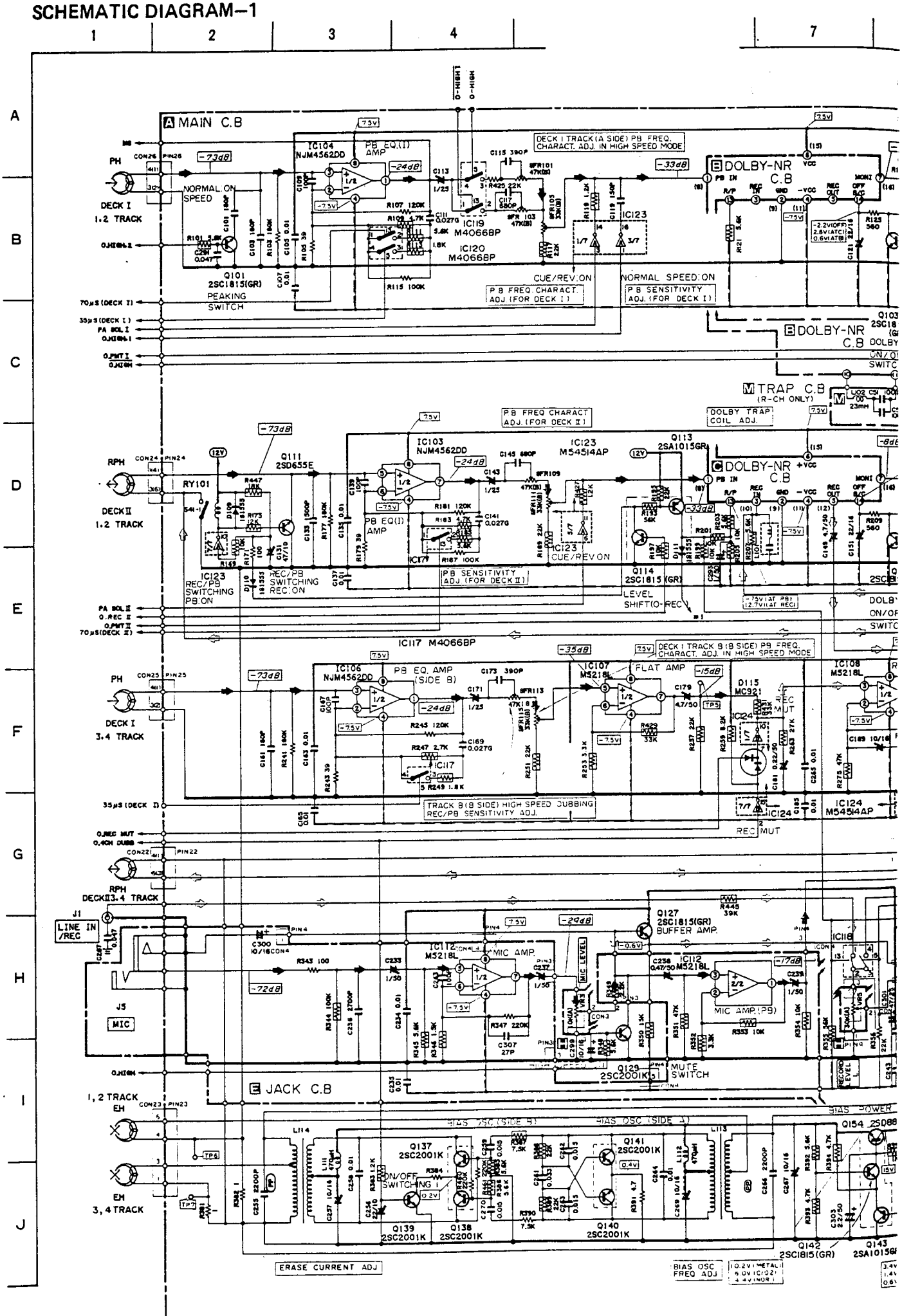
pins "H" level: +5[V], "L" level: 0[V] * OPMT I outputs "L" level during the MS search mode.

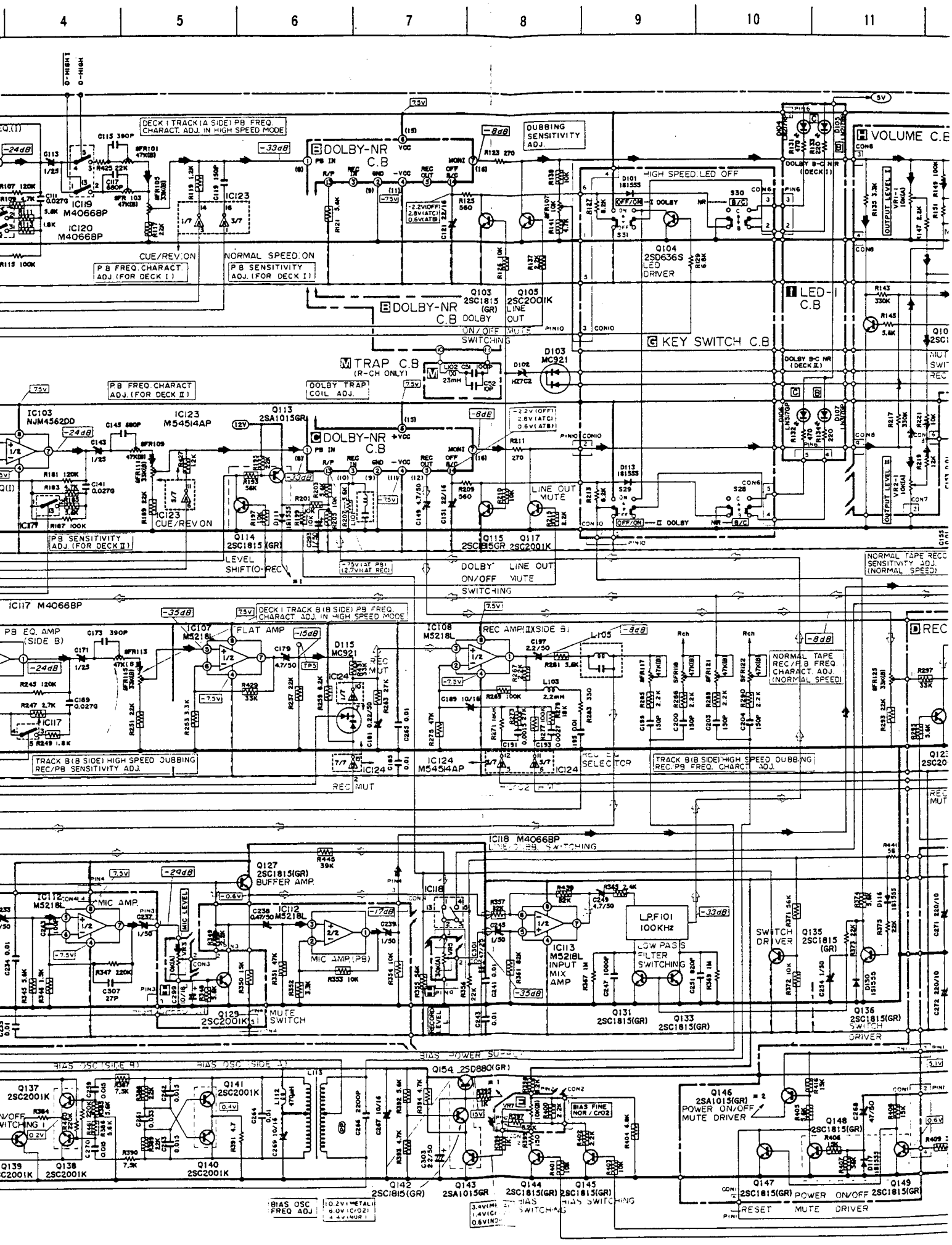
Function			
When STRB 0 is set to "H" level	**When STRB 1 is set to "H" level**	**When STRB 2 is set to "H" level**	**When STRB 3 is set to "H" level**
RWD key input (I)	RWD key input (II)	Cassette detection input (I)	MS key input No. 3
PLAY key input (I)	PLAY key input (II)	Cassette detection input (II)	MS key input No. 4
FF key input (I)	FF key input (II)	One side constant speed dubbing key input	MS key input No. 5
STOP key input (I)	STOP key input (II)	One side x2 speed dubbing key input	MS key input No. 6
PAUSE key input (I)	PAUSE key input (II)	MS select switch input	MS key input No. 7
Timer PLAY/REPEAT switch input (I)	REC key input (II)/Accidental erasure prevention key input (II)	Both side x2 speed dubbing key input	MS key input No. 8
Timer REC switch input (II)	REC MUTE key input (II)	MS key input No. 1	MS key input No. 9
Rear surface accidental erasure prevention key input (II)	Short-circuited by diode	MS key input No. 2	MS key input No. 10

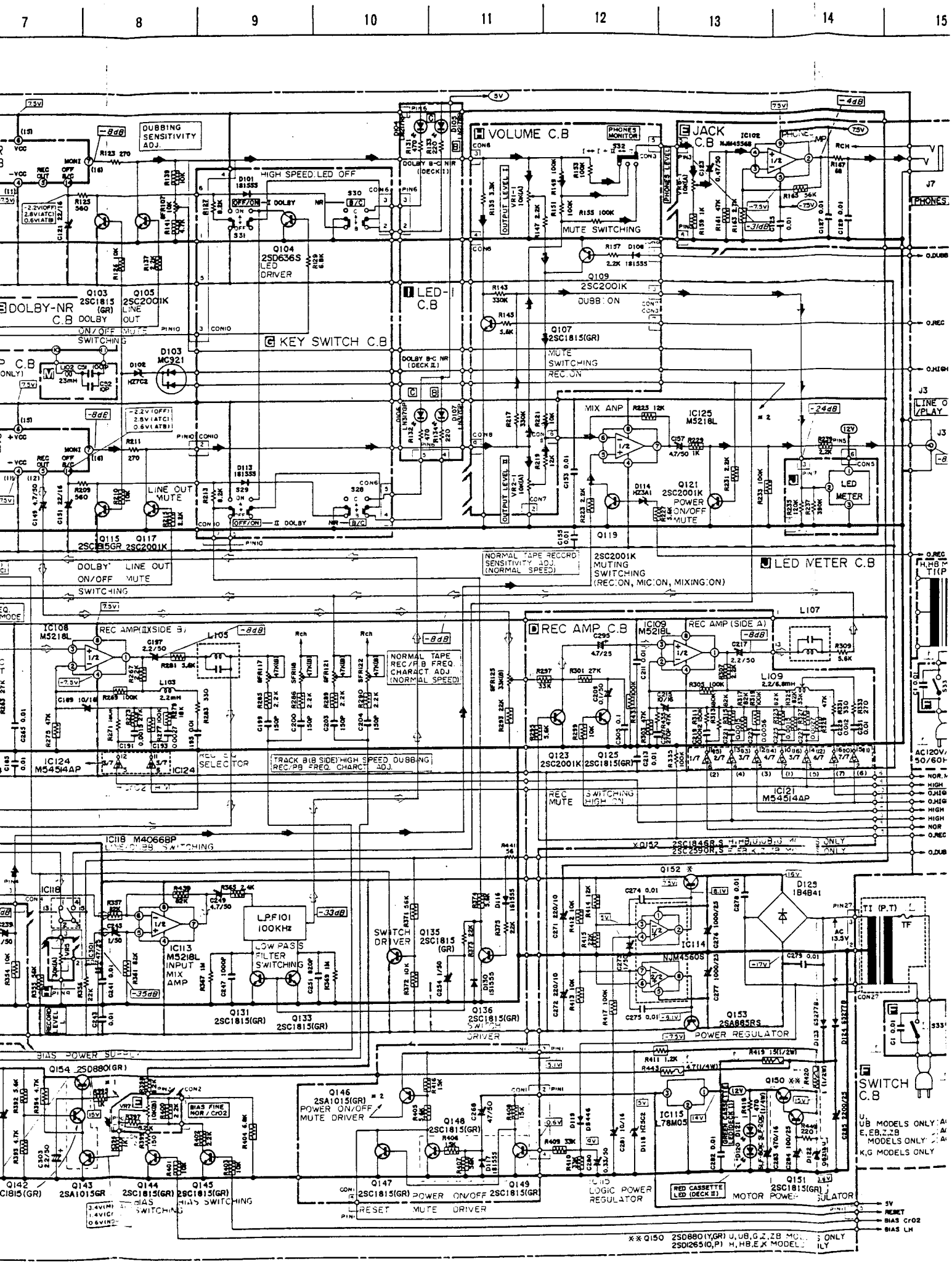
Pin No.	Terminal Symbol	When STRB 0 is set to "H" level
⑦	DISP 0	PLAY indication (II)
⑧	DISP 1	PAUSE indication (II)
⑨	DISP 2	REC MUTE indication (II)
⑩	DISP 3	REC indication (II)
⑪	ASTP. I	This pin is used to input th
⑫	ASTP. II	This pin is used to input th
⑬	MSSIG	This pin is used to detect i It is judged that a tune is to "L" level.
⑭	SYNC	This pin is used for syncr Set to REC PAUSE with "
⑪ ⑫ ⑬ ⑭	STRB 0 STRB 1 STRB 2 STRB 3	Pins 11 ~ 14 are the inp These pins are set to high of the matrix key, matrix i They are effective during starting at STRB 0 as show STRB0 STRB 1 STRB2 STRB3
⑮ ㉔	OREV I, OREV II	These pins are the submo and REV modes.
⑯ ㉕	OFWD I, OFWD II	These pins are the submo and CUE modes.
⑰ ㉖	SPAS I, SPAS II	These are the pause plunge PAUSE, CUE and REV mo
⑱ ㉗	SPLY I, SPLY II	These are the play plunger (REC) PLAY PAUSE, CUE
㉘ ㉙	$\overline{\text{OPMT I}}$, $\overline{\text{OPMT II}}$	These pins are set to the deck II) applied, and set to
㉚	$\overline{\text{ORMT. II}}$	This pin is set to the REC level when the mechanism i
㉛	$\overline{\text{OREC. II}}$	This pin is the REC/PLAY PAUSE modes.
㉜	0-DUBN	This is the one-side normal and both side x2 speed dubi
㉝	0-DUBH	This is the one-side x2 spe dubbing and both side x2 sp
㉞	$\overline{\text{SEARCH}}$	This is used for time consta PROGRAM MS PLAY mode
㉟	REVSLW	This is the output to reduc "H" level). This is set to "H rect detection of the start of
㊱ ㊲	M.MO.I, M.MO.II	These are the main motor These pins are set to "L" lev
⑲	$\overline{\text{RESET}}$	This pin is set to "H" level power supply (V_{DD}) so that
⑳ ㉑	TEST, Vss	Connect these pins to GND
㊳ ㊴ ㊵	$\overline{\text{HOLD}}$, $\overline{\text{INT}}$, V_{DD}	Connect these pins to +5 [V

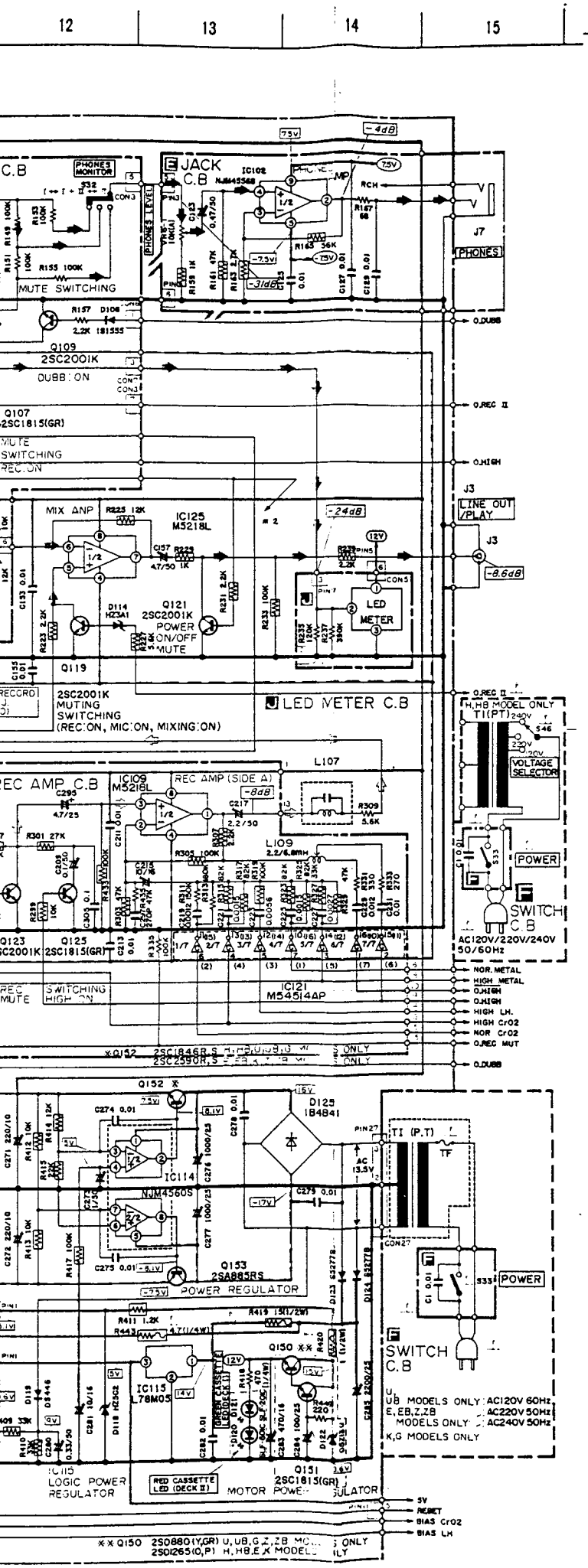
Pin No.	Terminal Symbol	Function			
		When STRB 0 is set to "H" level	When STRB 1 is set to "H" level	When STRB 2 is set to "H" level	When STRB 3 is set to "H" level
⑦	DISP 0	PLAY indication (II)	PLAY indication (I)	MS indication No. 3	MS indication No. 7
⑧	DISP 1	PAUSE indication (II)	PAUSE indication (I)	MS indication No. 4	MS indication No. 8
⑨	DISP 2	REC MUTE indication (II)	MS indication No. 1	MS indication No. 5	MS indication No. 9
⑩	DISP 3	REC indication (II)	MS indication No. 2	MS indication No. 6	MS indication No. 10
⑪	ASTP. I	This pin is used to input the pulse from the reel disk of deck (I) to detect the auto-stop mode.			
⑫	ASTP. II	This pin is used to input the pulse from the reel disk of deck (II) to detect the auto-stop mode.			
⑬	MSSIG	This pin is used to detect inter-tune gaps in the MS and PROGRAM-MS modes. It is judged that a tune is present when this pin is set to "H" level, and judged as no tune when it is set to "L" level.			
⑭	SYNC	This pin is used for syncrete recording. Pause is released with "H" level ⇒ "L" level during REC PAUSE. Set to REC PAUSE with "L" level ⇒ "H" level during recording.			
⑪ ⑫ ⑬ ⑭	STRB 0 STRB 1 STRB 2 STRB 3	Pins 11 ~ 14 are the input/output pins. (The above functions are provided as input.) These pins are set to high-impedance in the input mode and are used as the dynamic scan strobe signal of the matrix key, matrix indication in the output mode. They are effective during the "H" level, and Micro processer outputs a "H" level for 3.2ms in sequence starting at STRB 0 as shown in the diagram below, during operation. 			
⑮ ㉔	OREV I, OREV II	These pins are the submotor reverse outputs (deck I, deck II) and output "H" levels only during RWD and REV modes.			
⑯ ㉕	OFWD I, OFWD II	These pins are the submotor forward outputs (deck I, deck II) and output "H" levels only during FF and CUE modes.			
⑰ ㉖	SPAS I, SPAS II	These are the pause plunger outputs (deck I, deck II) and output "H" level only during the (REC) PLAY PAUSE, CUE and REV modes.			
⑱ ㉗	SPLY I, SPLY II	These are the play plunger outputs (deck I, deck II) and output "H" level only during the (REC) PLAY, (REC) PLAY PAUSE, CUE and REV modes.			
㉘ ㉙	$\overline{\text{OPMT I}}$, $\overline{\text{OPMT II}}$	These pins are set to the (REC) PLAY, CUE and REV modes with the PLAY MUTE outputs (deck I, deck II) applied, and set to "H" level when the mechanism is stabilized and muting released.			
㉚	$\overline{\text{ORMT. II}}$	This pin is set to the REC PLAY mode with the REC MUTE output (deck II) applied, and set to "H" level when the mechanism is stabilized and muting released.			
㉛	$\overline{\text{OREC. II}}$	This pin is the REC/PLAY select output and outputs "H" level only during the REC PLAY, REC PLAY PAUSE modes.			
㉜	0-DUBN	This is the one-side normal dubbing output and outputs "H" level only during one-side normal dubbing and both side x2 speed dubbing.			
㉝	0-DUBH	This is the one-side x2 speed dubbing output, and output "H" level only during the one-side x2 speed dubbing and both side x2 speed dubbing.			
㉞	$\overline{\text{SEARCH}}$	This is used for time constant selection during the PROGRAM MS mode. Outputs "H" level during the PROGRAM MS PLAY mode and "L" level during the search mode.			
㉟	REVSLW	This is the output to reduce the submotor speed during the REV MS search mode. (Reduces speed at "H" level). This is set to "H" level during the CUE MS search mode and during the REV mode for correct detection of the start of tunes.			
㊱ ㊲	M.MO.I, M.MO.II	These are the main motor outputs (deck I, deck II); the motor turns with these pins set to "H" level. These pins are set to "L" level only during the STOP, PAUSE, FF and RWD modes.			
⑲	$\overline{\text{RESET}}$	This pin is set to "H" level with delay determined by the time constant component of the CR from the power supply (V_{DD}) so that the Micro processer is reset.			
⑳ ㉑	TEST, V_{SS}	Connect these pins to GND [0 (V)].			
㊳ ㊴ ㊵	$\overline{\text{HOLD}}$, $\overline{\text{INT}}$, V_{DD}	Connect these pins to +5 [V].			

SCHEMATIC DIAGRAM–1




4
5
6
7
8
9
10
11
DECK I TRACK (A SIDE) PB FREQ. CHARACT. ADJ. IN HIGH SPEED MODE
DOLBY-NR C.B
DUBBING SENSITIVITY ADJ.
VOLUME C.B
HIGH SPEED LED OFF
IC119 M40668P
IC120 M40668P
CUE/REV ON
NORMAL SPEED ON
PB FREQ. CHARACT ADJ. (FOR DECK I)
PB SENSITIVITY ADJ. (FOR DECK I)
Q104 2SD636S LED DRIVER
Q103 2SC1815 (GR) DOLBY LINE OUT
Q105 2SC2001K LINE OUT
ON/OFF MUTE SWITCHING
LED-I C.B
KEY SWITCH C.B
TRAP C.B (R-CH ONLY)
D103 MC921
PB FREQ. CHARACT ADJ. (FOR DECK II)
DOLBY TRAP COIL ADJ.
IC103 NJM4562DD
IC123 M54514AP
Q113 2SA1015GR
DOLBY-NR C.B
IC123 CUE/REV ON
PB SENSITIVITY ADJ. (FOR DECK II)
Q114 2SC1815 (GR) LEVEL SHIFT(O-REC)
Q115 2SC1815GR
Q117 2SC2001K
DOLBY LINE OUT ON/OFF MUTE SWITCHING
LINE OUT MUTE
NORMAL TAPE RECO SENSITIVITY ADJ. (NORMAL SPEED)
IC117 M40668P
PB EQ. AMP (SIDE B)
IC107 M5218L
FLAT AMP
DECK I TRACK B (B SIDE) PB FREQ. CHARACT. ADJ. IN HIGH SPEED MODE
D115 MC921
REC MUT
IC108 M5218L
REC AMP (II SIDE B)
NORMAL TAPE REC/P.B FREQ. CHARACT. ADJ. (NORMAL SPEED)
TRACK B (B SIDE) HIGH SPEED DUBBING REC/PB SENSITIVITY ADJ.
IC124 M54514AP
REC SELECTOR
TRACK B (B SIDE) HIGH SPEED DUBBING REC. PB FREQ. CHARCT. ADJ.
IC118 M40668P
LINE/PB SWITCHING
Q127 2SC1815(GR) BUFFER AMP.
IC112 M5218L
MIC AMP.
MIC AMP.(PB)
Q129 2SC2001K MUTE SWITCH
IC113 M5218L INPUT MIX AMP
LPF101 100KHz LOW PASS FILTER SWITCHING
Q131 2SC1815(GR)
Q133 2SC1815(GR)
Q135 2SC1815 (GR) SWITCH DRIVER
Q136 2SC1815(GR) SWITCH DRIVER
BIAS POWER SUPPLY
BIAS OSC (SIDE B)
BIAS OSC (SIDE A)
Q154 2SD880(GR)
Q137 2SC2001K
Q141 2SC2001K
Q139 2SC2001K
Q138 2SC2001K
Q140 2SC2001K
Q142 2SC1815(GR)
Q143 2SA1015GR
Q144 2SC1815(GR)
Q145 2SC1815(GR)
BIAS FINE NOR / CrO2
BIAS SWITCHING
BIAS OSC FREQ ADJ
Q146 2SA1015(GR) POWER ON/OFF MUTE DRIVER
Q147 2SC1815(GR) POWER ON/OFF RESET MUTE DRIVER
Q148 2SC1815(GR)
Q149 2SC1815(GR)


7
8
9
10
11
12
13
14
15
VOLUME C.B
JACK C.B
LED-I C.B
KEY SWITCH C.B
DOLBY-NR C.B
LED METER C.B
REC AMP C.B
SWITCH C.B
DUBBING SENSITIVITY ADJ.
HIGH SPEED LED OFF
MUTE SWITCHING
DUBB ON
REC ON
MIX AMP
LINE OUT MUTE
DOLBY LINE OUT ON/OFF MUTE SWITCHING
NORMAL TAPE RECORD SENSITIVITY ADJ. (NORMAL SPEED)
2SC2001K MUTING SWITCHING (REC ON, MIC ON, MIXING ON)
REC AMP (SIDE B)
REC AMP (SIDE A)
NORMAL TAPE REC/PB FREQ. CHARACT. ADJ (NORMAL SPEED)
TRACK B(B SIDE) HIGH SPEED DUBBING REC/PB FREQ. CHARCT. ADJ.
REC SELECTOR
REC MUTE SWITCHING HIGH ON
LOW PASS FILTER SWITCHING
LINE OUT/DUB SWITCHING
BIAS POWER SUPPLY
BIAS FINE NOR / CrO2
BIAS SWITCHING
POWER ON/OFF MUTE DRIVER
RESET MUTE DRIVER
LOGIC POWER REGULATOR
MOTOR POWER REGULATOR
RED CASSETTE LED (DECK II)
IC108 M5218L
IC109 M5218L
IC124 M54514AP
IC121 M54514AP
IC118 M40668P
IC113 M5218L INPUT MIX AMP
IC114 NJM4560S
IC115 L78M05
IC125 M5218L
Q104 2SD636S LED DRIVER
Q105 2SC2001K LINE OUT
Q103 2SC1815 (GR) DOLBY
Q107 2SC1815(GR) MUTE SWITCHING REC ON
Q109 2SC2001K DUBB ON
Q115 Q117 2SC1815GR 2SC2001K
Q119 2SC2001K MUTING SWITCHING (REC ON, MIC ON, MIXING ON)
Q121 2SC2001K POWER ON/OFF MUTE
Q123 2SC2001K 2SC1815(GR)
Q125 2SC1815(GR)
Q131 2SC1815(GR)
Q133 2SC1815(GR)
Q135 2SC1815 (GR) SWITCH DRIVER
Q136 2SC1815(GR) SWITCH DRIVER
Q142 C1815(GR)
Q143 2SA1015GR
Q144 2SC1815(GR)
Q145 2SC1815(GR)
Q146 2SA1015(GR) POWER ON/OFF MUTE DRIVER
Q147 2SC1815(GR) POWER ON/OFF
Q148 2SC1815(GR)
Q149 2SC1815(GR)
Q150 ** 2SD880(Y,GR) U,UB,G,Z,ZB MODELS ONLY 2SD1265(O,P) H,HB,E,K MODELS ONLY
Q151 2SC1815(GR)
Q152 *
Q153 2SA895RS POWER REGULATOR
Q154 2SD880(GR)
D129 1B4B41
L107
L109 2.2/6.8mH
L105
L103
TF
J7 PHONES
J3 LINE O /PLAY
LED METER
AC120V/ 50/60H
-8dB
-24dB
-33dB
-35dB
-31dB
-4dB
-2.2V(OFF) 2.8V(ATC) 0.6V(ATB)
7.5V
12V
5V
-7.5V
-17V
15V
O.DUB
O.REC
O.HIGH
NOR
RESET
BIAS CrO2
BIAS LH
* Q152 2SC1846R,S H,HB,U,UB,G,K MODELS ONLY 2SC2590R,S E,EB,Z,ZB MODELS ONLY
** Q150 2SD880(Y,GR) U,UB,G,Z,ZB MODELS ONLY 2SD1265(O,P) H,HB,E,K MODELS ONLY



NOTES:

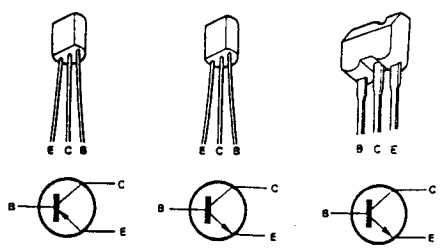
1) ■ B (+) power supply ■■■ B (−) power supply
2) ➡ Signal path
   ⇨ Rec path
3) The voltage is the reference value measured with a tester (20 k-ohms/V DC) when there are no signals.
   But ( ) is with recording.
   An asterisk (*) indicates that the value was measured with a vacuum-tube voltmeter during recording.
4) Resistors with no designation have a rated power of 1/8W and a tolerance of ±5%.
5) Capacitors with no designation have a dielectric strength of less than 50WV.
6) The only capacitor tolerance indicated are ±5% (J) and ±10% (K).
7) Ceramic capacitor symbols:
   —‖— For temperature compensation (SL)
   —‖— High dielectric constant system (YY)
   —‖— High dielectric constant system (YW, YP, YZ)
   —‖— Semiconductor ceramic
   —‖— For temperature compensation (SH)
8) Explanation of symbols
   (M) Mylar capacitor
   (A) Aluminum solid capacitor
   (PP) Polypropylene film capacitor
   (BP) Bi-polarized capacitor
   (LL) Low-leakage capacitor
   Printed resistor
   Fuse resistor
   Nonflammable resistor

⚠ Safety component symbol

This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications.
Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.

- This schematic diagram is subject to change without notice in the interests of improved performance.

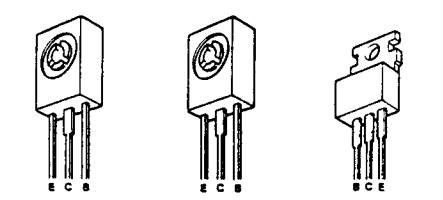
S28	II DECK, DOLBY-NR B/C (B)
S29	II DECK,DOLBY-NR ON/OFF (OFF)
S30	I DECK, DOLBY-NR B/C (B)
S31	I DECK, DOLBY-NR ON/OFF (OFF)
S32	PHONES MONITOR (I)
S33	POWER
S41	(RELAY SW)
S46	VOLTAGE SELECTOR (H,HB models only)



2SA952
2SA1015

2SC1815
2SC2001
2SD655

2SD636

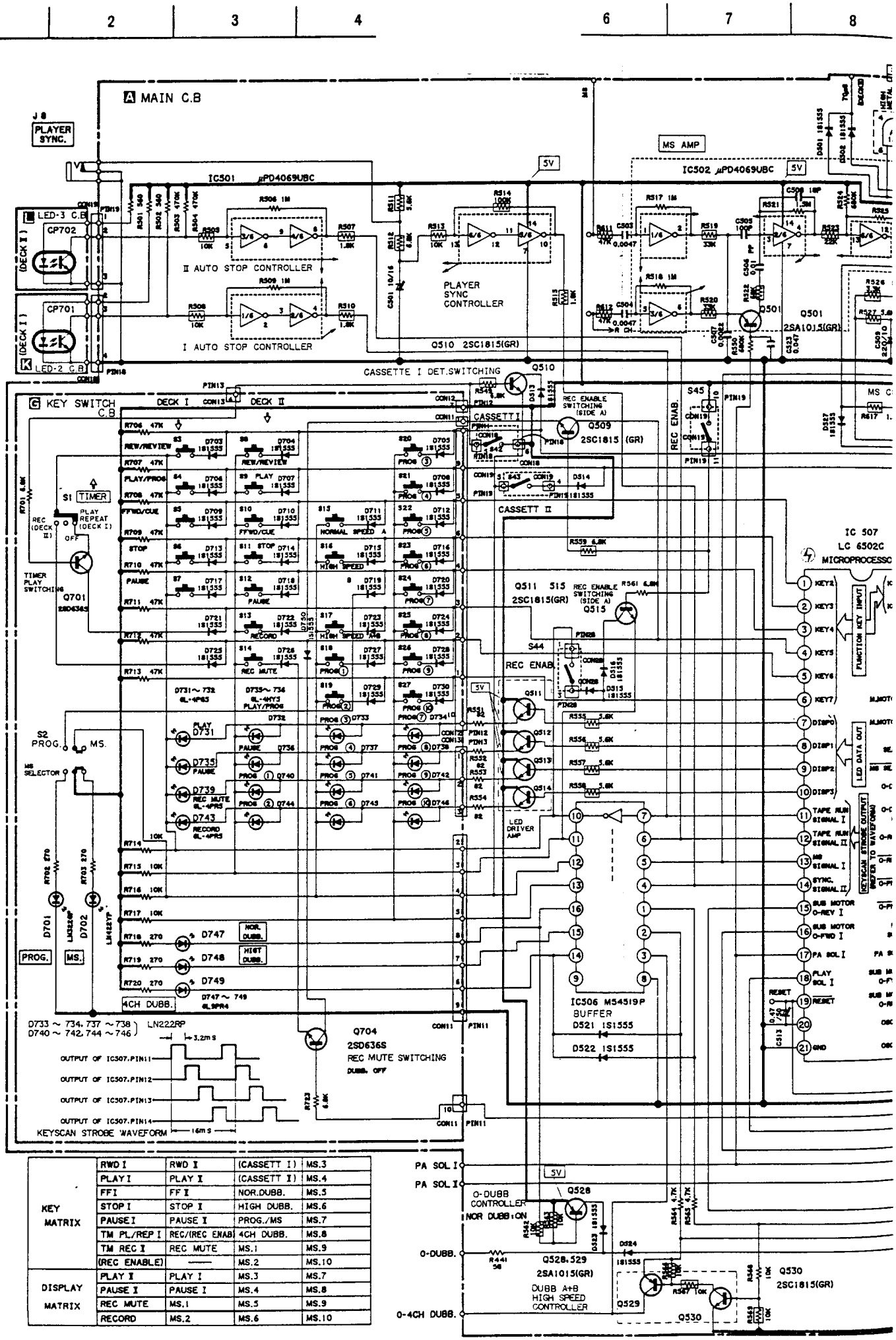


2SA885

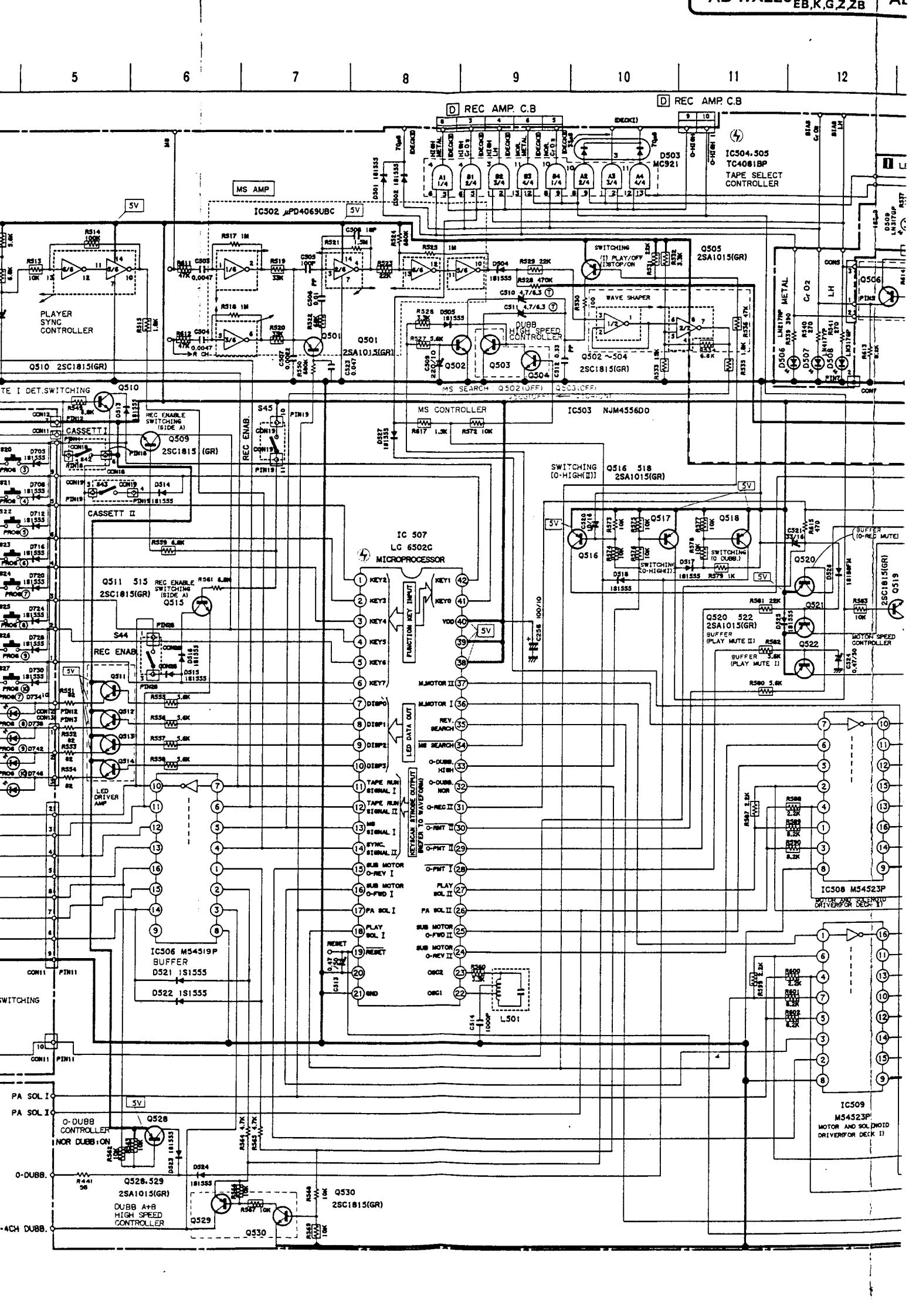
2SC1846
2SC2590

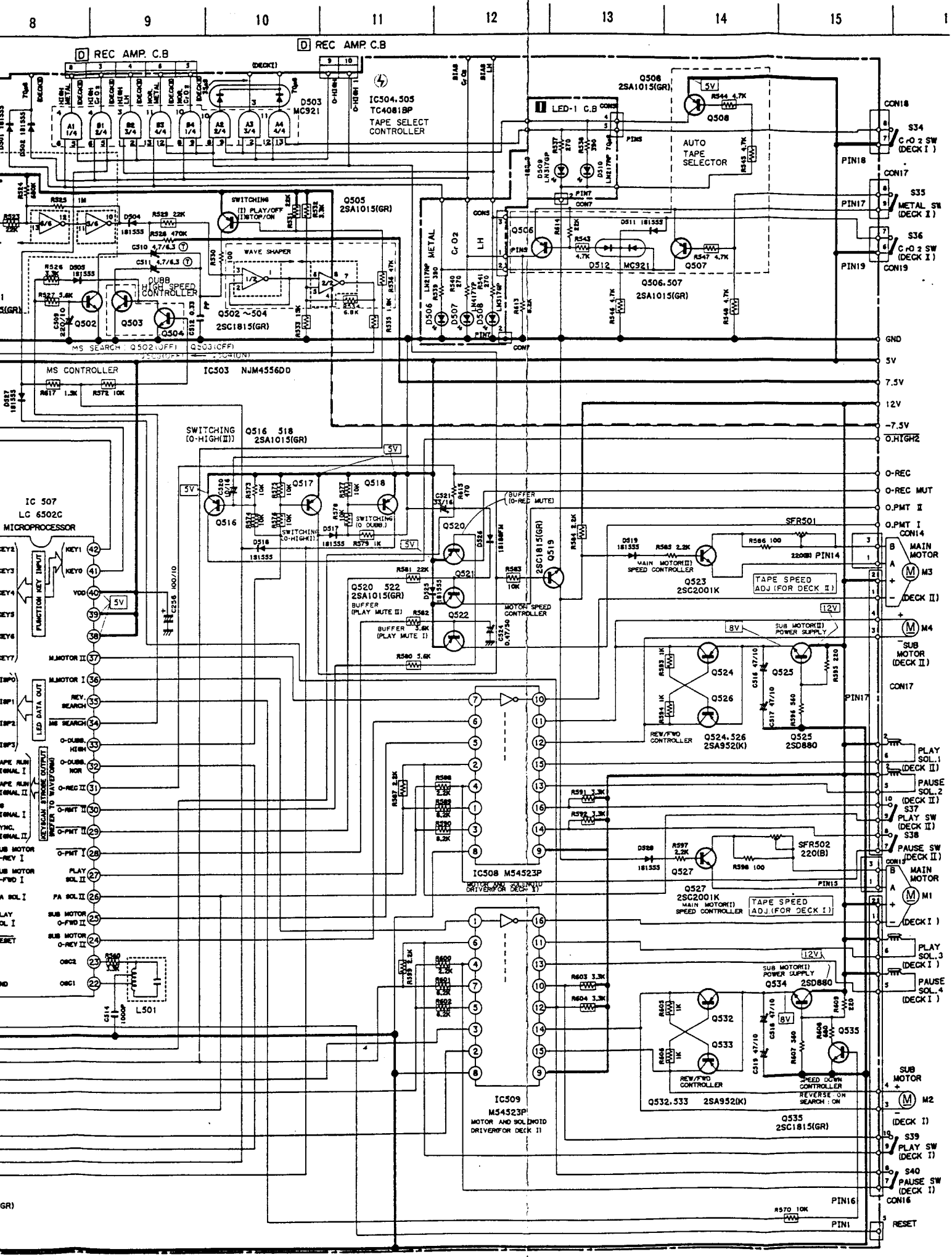
2SD880
2SD1265

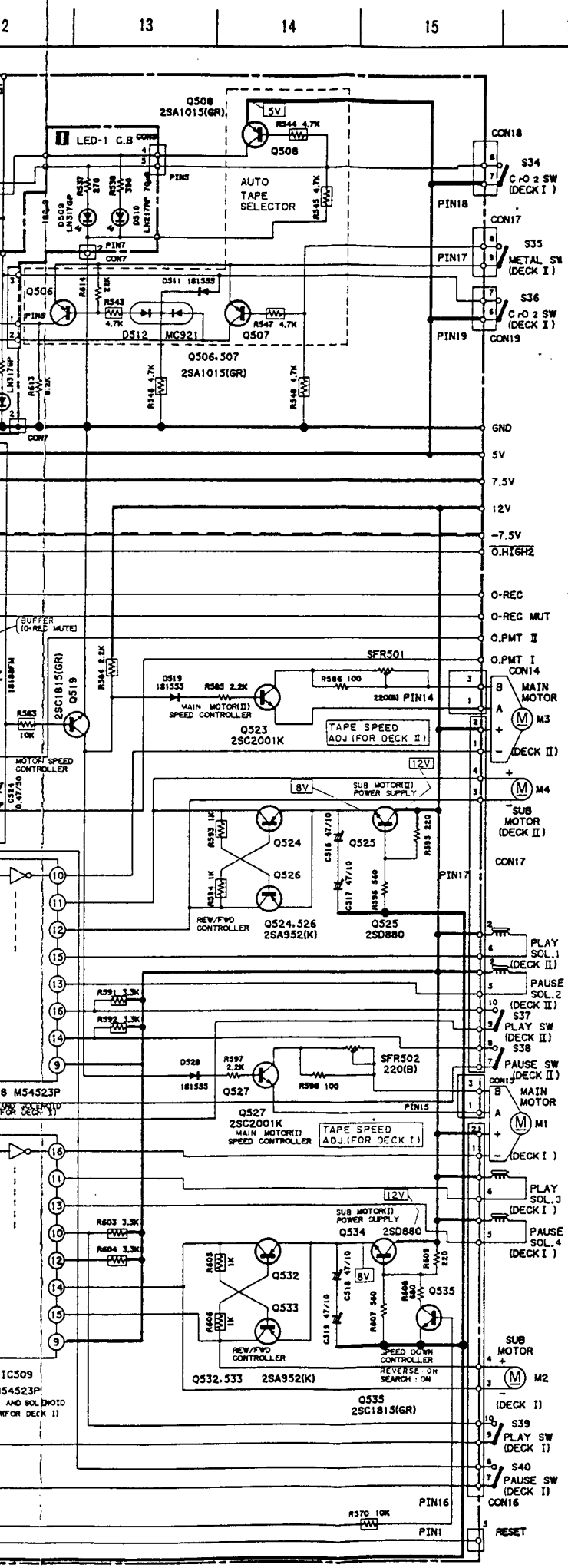
SCHEMATIC DIAGRAM–2



KEY MATRIX	RWD I	RWD I	(CASSETT I)	MS.3
	PLAY I	PLAY I	(CASSETT I)	MS.4
	FFI	FF I	NOR.DUBB.	MS.5
	STOP I	STOP I	HIGH DUBB.	MS.6
	PAUSE I	PAUSE I	PROG./MS	MS.7
	TM PL/REP I	REC/(REC ENAB)	4CH DUBB.	MS.8
	TM REC I	REC MUTE	MS.1	MS.9
	(REC ENABLE)	——	MS.2	MS.10
DISPLAY MATRIX	PLAY I	PLAY I	MS.3	MS.7
	PAUSE I	PAUSE I	MS.4	MS.8
	REC MUTE	MS.1	MS.5	MS.9
	RECORD	MS.2	MS.6	MS.10


5
6
7
8
9
10
11
12
D REC AMP. C.B
D REC AMP. C.B
IC504,505
TC4081BP
TAPE SELECT
CONTROLLER
D503
MC921
MS AMP
IC502 μPD4069UBC
5V
PLAYER
SYNC
CONTROLLER
Q501
2SA1015(GR)
Q502
Q503
Q504
Q502 ~504
2SC1815(GR)
Q505
2SA1015(GR)
SWITCHING
(I) PLAY/OFF
(II)STOP/ON
WAVE SHAPER
DUBB
HIGH SPEED
CONTROLLER
Q506
Q510
2SC1815(GR)
Q510
REC ENABLE
SWITCHING
(SIDE A)
Q509
2SC1815 (GR)
CASSETT I
CASSETT II
REC ENAB.
S45
S44
MS CONTROLLER
IC503 NJM4556DD
SWITCHING
[O-HIGH(II)]
Q516 518
2SA1015(GR)
Q516
Q517
Q518
SWITCHING
(O DUBB.)
IC 507
LC 6502C
MICROPROCESSOR
FUNCTION KEY INPUT
LED DATA OUT
KEYMAN STROBE OUTPUT
(REFER TO WAVEFORM)
Q511 515
2SC1815(GR)
REC ENABLE
SWITCHING
(SIDE A)
Q515
LED
DRIVER
AMP
IC506 M54519P
BUFFER
D521 1S1555
D522 1S1555
Q520 522
2SA1015(GR)
BUFFER
(PLAY MUTE II)
BUFFER
(PLAY MUTE I)
Q520
Q521
Q522
Q519
2SC1815(GR)
MOTOR SPEED
CONTROLLER
BUFFER
(O-REC MUTE)
IC508 M54523P
MOTOR AND SOLENOID
DRIVERFOR DECK II
IC509
M54523P
MOTOR AND SOLENOID
DRIVERFOR DECK I
L501
PA SOL I
PA SOL II
O-DUBB
CONTROLLER
NOR DUBB:ON
Q528
Q528.529
2SA1015(GR)
DUBB A+B
HIGH SPEED
CONTROLLER
Q529
Q530
Q530
2SC1815(GR)
O-DUBB.
-4CH DUBB.


8
9
10
11
12
13
14
15
D REC AMP. C.B
D REC AMP. C.B
IC504.505
TC4081BP
TAPE SELECT
CONTROLLER
D503
MC921
LED-1 C.B
Q508
2SA1015(GR)
AUTO
TAPE
SELECTOR
Q505
2SA1015(GR)
SWITCHING
(I) PLAY/OFF
(II)STOP/ON
WAVE SHAPER
DUBB
HIGH SPEED
CONTROLLER
Q502 ~504
2SC1815(GR)
Q506
Q512
MC921
Q507
Q506.507
2SA1015(GR)
MS SEARCH : Q502(OFF) Q503(OFF) Q504(ON)
MS CONTROLLER
IC503 NJM4556DD
SWITCHING Q516 518
[O-HIGH(II)] 2SA1015(GR)
IC 507
LC 6502C
MICROPROCESSOR
Q516
Q517
Q518
Q520
Q521
Q522
Q520 522
2SA1015(GR)
BUFFER
(PLAY MUTE II)
BUFFER
(PLAY MUTE I)
BUFFER
(O-REC MUTE)
SWITCHING
(O DUBB.)
SWITCHING
[O-HIGH(I)]
MOTOR SPEED
CONTROLLER
2SC1815(GR)
Q519
SFR501
MAIN MOTOR(II)
SPEED CONTROLLER
Q523
2SC2001K
TAPE SPEED
ADJ.(FOR DECK II)
SUB MOTOR(II)
POWER SUPPLY
Q524
Q526
Q524.526
2SA952(K)
Q525
2SD880
REW/FWD
CONTROLLER
IC508 M54523P
MOTOR AND SOLENOID
DRIVERFOR DECK I
Q527
2SC2001K
MAIN MOTOR(I)
SPEED CONTROLLER
SFR502
220(B)
TAPE SPEED
ADJ.(FOR DECK I)
SUB MOTOR(I)
POWER SUPPLY
Q532
Q533
Q532.533 2SA952(K)
Q534 2SD880
Q535
2SC1815(GR)
REW/FWD
CONTROLLER
SPEED DOWN
CONTROLLER
REVERSE ON
SEARCH : ON
IC509
M54523P
MOTOR AND SOLENOID
DRIVERFOR DECK II
L501
GND
5V
7.5V
12V
-7.5V
O.HIGH2
O-REC
O-REC MUT
O.PMT II
O.PMT I
M.MOTOR II
M.MOTOR I
REV. SEARCH
MS SEARCH
O-DUBB. HIGH
O-DUBB. NOR
O-REC II
O-PMT II
O-PMT II
O-PMT I
PLAY SOL II
PA SOL II
SUB MOTOR O-FWD II
SUB MOTOR O-REV II
OSC2
OSC1
RESET
CON18
CON17
CON19
CON16
CON14
CON13
PIN18
PIN17
PIN19
PIN16
PIN15
PIN14
PIN1
S34 C.rO 2 SW (DECK I)
S35 METAL SW (DECK I)
S36 C.rO 2 SW (DECK I)
S37 PLAY SW (DECK II)
S38 PAUSE SW (DECK II)
S39 PLAY SW (DECK I)
S40 PAUSE SW (DECK I)
MAIN MOTOR M3 (DECK II)
SUB MOTOR (DECK II) M4
MAIN MOTOR M1 (DECK I)
SUB MOTOR M2 (DECK I)
PLAY SOL.1 (DECK II)
PAUSE SOL.2 (DECK II)
PLAY SOL.3 (DECK I)
PAUSE SOL.4 (DECK I)
RESET



S1	TIMER
S2	MS SELECTOR
S3	I DECK, REW/REV.
S4	IDECK, PLAY/PROGRAM
S5	I DECK, F.FWD/CUE.
S6	I DECK, STOP
S7	I DECK, PAUSE
S8	II DECK, REW/REV.
S9	II DECK, PLAY
S10	II DECK, F.FWD/CUE.
S11	II DECK, STOP
S12	II DECK, PAUSE
S13	II DECK, RECORD
S14	II DECK, REC MUTE
S15	DUBBING, A
S16	DUBBING, B
S17	DUBBING, A+B
S18	PROGRAM 1
S19	PROGRAM 2
S20	PROGRAM 3
S21	PROGRAM 4
S22	PROGRAM 5
S23	PROGRAM 6
S24	PROGRAM 7
S25	PROGRAM 8
S26	PROGRAM 9
S27	PROGRAM 10
S34	I DECK, CrO_2
S35	II DECK, METAL
S36	II DECK, CrO_2
S37	II DECK, PLAY
S38	II DECK, PAUSE
S39	I DECK, PLAY
S40	II DECK, PAUSE
S42	I DECK, CASSETTE
S43	II DECK, CASSETTE
S44	REC ENABLE
S45	REC ENABLE

MECHA STATE SW	OREV	OFWD	SPAS	SPLY	M.MO
STOP					✱
PAUSE					✱
FF		○			✱
RWD	○				✱
CUE		○	○	○	○
REV	○		○	○	○
PLAY (REC PLAY)				○	○
PLAY-PAUSE (REC PLAY PAUSE)			○	○	○

✱The main motor control output becomes "L" level 1 second after the mechanism enters the modes marked✱.

Marked ○: Outputs "H" level.

No mark : Outputs "L" level.